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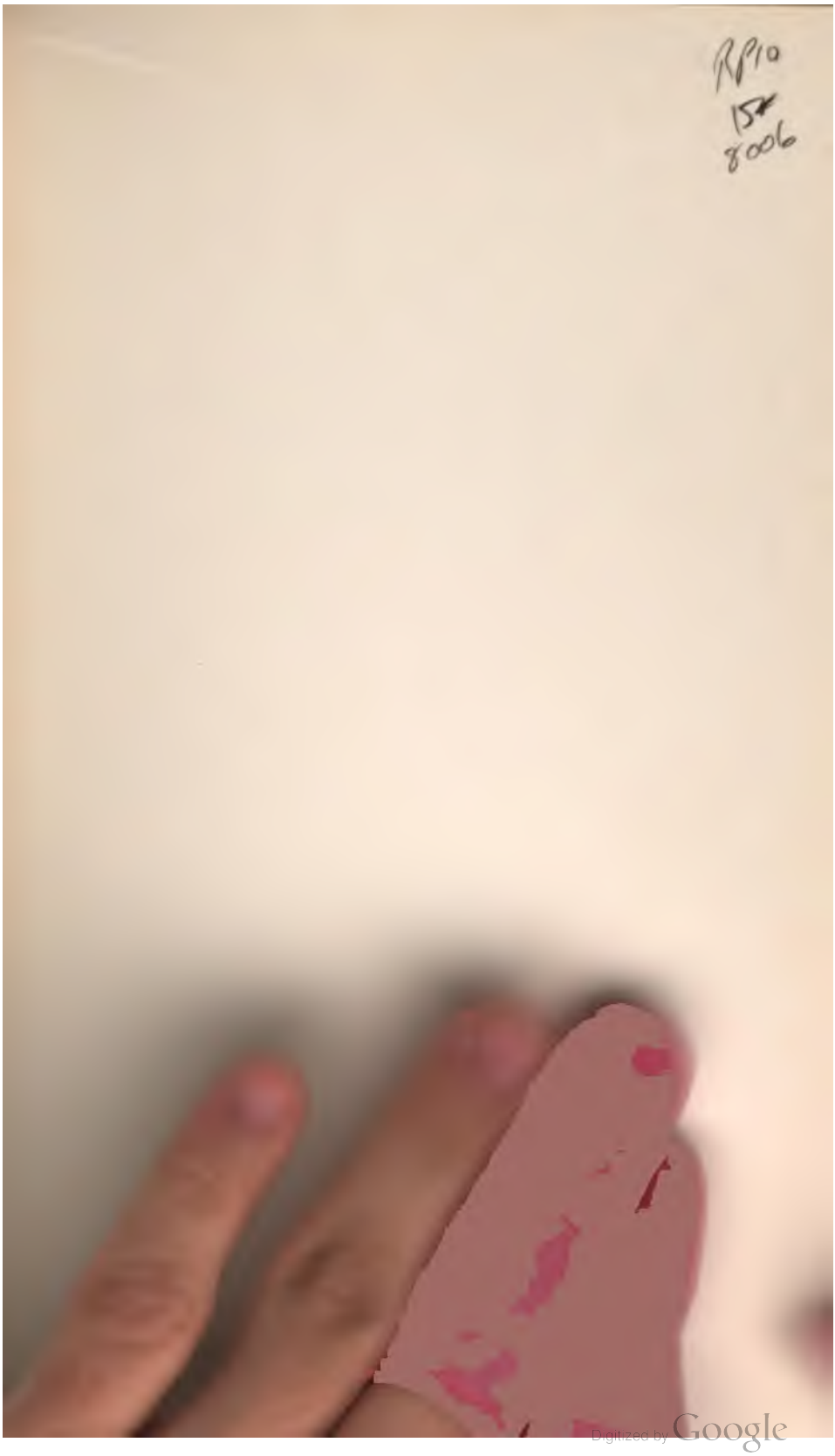
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FRANKLIN K. LANE, Secretary

UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, Director

Water-Supply Paper 391

SURFACE WATER SUPPLY OF THE UNITED STATES

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GEORGE OTIS SMITH, Director

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SURFACE WATER SUPPLY OF PACIFIC SLOPE BASINS IN CALIFORNIA, 1914.

AUTHORIZATION AND SCOPE OF WORK.

This volume is one of a series of 14 reports presenting results of measurements of flow made on streams in the United States during the year ending September 30, 1914.

The data presented in these reports were collected by the United States Geological Survey under authority implied in the organic law (20 Stat. L., p. 394), which contains the following paragraph:

Provided, That this officer [the Director] shall have the direction of the Geological Survey and the classification of public lands and examination of the geological structure, mineral resources, and products of the national domain.

The work was begun in 1888 in connection with special studies of water supply for irrigation. Since the fiscal year ending June 30, 1895, successive sundry civil bills passed by Congress have carried the following item and appropriations:

For gaging the streams and determining the water supply of the United States, and for the investigation of underground currents and artesian wells, and for the preparation of reports upon the best methods and utilizing the water resources.

Annual appropriations for the fiscal years ending June 30, 1895–1915.

1895	$12,500
1896	20,000
1897 to 1900, inclusive	50,000
1901 to 1902, inclusive	100,000
1903 to 1906, inclusive	200,000
1907	150,000
1908 to 1910, inclusive	100,000
1911 to 1915, inclusive	150,000

In the execution of the work many private and State organizations have cooperated, either by furnishing data or by assisting in collecting data. Acknowledgments for cooperation of the first kind are made in connection with the description of each station affected; cooperation of the second kind is acknowledged on page 15.

Measurements of stream flow have been made at about 3,400 points in the United States and also at many points in small areas in Seward Peninsula and the Yukon-Tanana region, Alaska, and the Hawaiian

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Islands. In July, 1914, 1,480 gaging stations were being maintained by the Survey and the cooperating organizations. Many miscellaneous discharge measurments were made at other points. In connection with this work data were also collected in regard to precipitation, evaporation, storage reservoirs, river profiles, and water power in many sections of the country, and will be made available in water-supply papers from time to time. Information in regard to publications relating to water resource is presented in the appendix to this report.

DEFINITION OF TERMS.

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms, each of which has become associated with work of a certain class. These terms may be divided into two groups—(1) those that represent the rate of flow, as second-feet, gallons per minute, miner's inches, and discharge in second-feet per square mile, and (2) those that represent the actual quantity of water, as run-off in depth in inches, acre-feet, and millions of cubic feet. The principal terms used in this series of reports are second-feet, second-feet per square mile, run-off in inches, acre-feet, and millions of cubic feet. They may be defined as follows:

"Second-feet" is an abbreviation for "cubic feet per second." A second-foot is the rate of discharge of water flowing in a channel of rectangular cross section 1 foot wide and 1 foot deep at an average velocity of 1 foot per second. It is generally used as a fundamental unit from which others are computed by the use of the factors given in the tables of convenient equivalents (p. 11).

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

"Run-off (depth in inches)" is the depth to which the drainage area would be covered if all the water flowing from it in a given period were conserved and uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth of inches.

An "acre-foot," is equivalent to 43,560 cubic feet and is the quantity required to cover an acre to the depth of 1 foot. The term is commonly used in connection with storage.

"Millions of cubic feet" is used to express quantities of water stored in reservoirs, most frequently in connection with studies of flood control.

The following terms used in these reports are not in common use:

"Stage-discharge relation," an abbreviation for the term "relation of gage height to discharge."

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"Control," "control section," and "point of control," terms used to designate the section or sections of the stream below the gage which determine the discharge relation at the gage. It should be noted that the control may not be the same section or sections at all stages.

The "point of zero flow" for a given gaging station is that point on the gage—the gage height—to which the surface of the river would fall if there were no flow.

CONVENIENT EQUIVALENTS.

The following is a list of convenient equivalents for use in hydraulic computations:

Table for converting discharge in second-feet per square mile into run-off in depth in inches over the area.

Discharge in second-feet per square mile.	Run-off in inches.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1.....	0.03719	1.041	1.079	1.116	1.153
2.....	.07438	2.083	2.157	2.231	2.306
3.....	.11157	3.124	3.236	3.347	3.459
4.....	.14876	4.165	4.314	4.463	4.612
5.....	.18595	5.207	5.393	5.578	5.764
6.....	.22314	6.248	6.471	6.694	6.917
7.....	.26033	7.289	7.550	7.810	8.070
8.....	.29752	8.331	8.628	8.926	9.223
9.....	.33471	9.372	9.707	10.041	10.376

NOTE.—For part of a month multiply the run-off for 1 day by the number of days.

Table for converting discharge in second-feet into run-off in acre-feet.

Discharge in second-feet.	Run-off in acre-feet.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1.....	1.983	55.54	57.52	59.50	61.49
2.....	3.967	111.1	115.0	119.0	123.0
3.....	5.950	166.6	172.6	178.5	184.5
4.....	7.934	222.1	230.1	238.0	246.0
5.....	9.917	277.7	287.6	297.5	307.4
6.....	11.90	333.2	345.1	357.0	368.9
7.....	13.88	388.8	402.6	416.5	430.4
8.....	15.87	444.3	460.2	476.0	491.9
9.....	17.85	499.8	517.7	535.5	553.4

NOTE.—For part of a month multiply the run-off for 1 day by the number of days.

Table for converting discharge in second-feet into run-off in millions of cubic feet.

Discharge in second-feet.	Run-off in millions of cubic feet.				
	1 day.	28 days.	29 days.	30days.	31 days.
1.....	0.0864	2.419	2.506	2.592	2.678
2.....	.1728	4.838	5.012	5.184	5.356
3.....	.2592	7.257	7.518	7.776	8.034
4.....	.3456	9.676	10.02	10.37	10.71
5.....	.4320	12.10	12.53	12.96	13.39
6.....	.5184	14.51	15.04	15.55	16.07
7.....	.6048	16.93	17.54	18.14	18.75
8.....	.6912	19.35	20.05	20.74	21.42
9.....	.7776	21.77	22.55	23.33	24.10

NOTE.—For part of a month multiply the run-off for 1 day by the number of days.

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Table for converting discharge in second-feet into run-off in millions of gallons.

Discharge in second-feet.	Run-off in millions of gallons.				
	1 day.	28 days.	29 days.	30 days.	31 days.
1.....	0.6463	18.10	18.74	19.39	20.04
2.....	1.293	36.20	37.48	38.78	40.08
3.....	1.939	54.30	56.22	58.17	60.12
4.....	2.585	72.40	74.96	77.56	80.16
5.....	3.232	90.50	93.70	96.95	100.2
6.....	3.878	108.6	112.4	116.3	120.2
7.....	4.524	126.7	131.2	135.7	140.3
8.....	5.171	144.8	149.9	155.1	160.3
9.....	5.817	162.9	168.7	174.5	180.4

NOTE.—For part of a month multiply the run-off for 1 day by the number of days.

Table for converting velocity in feet per second into velocity in miles per hour.

[1 foot per second=0.681818 mile per hour, or two-thirds mile per hour, very nearly; 1 mile per hour=1.4666 feet per second. In computing the table the figures 0.68182 and 1.4667 were used.]

Feet per second (units).	Miles per hour for tenths of foot per second.									
	0	1	2	3	4	5	6	7	8	9
0.....	0.000	0.068	0.136	0.205	0.273	0.341	0.409	0.477	0.545	0.614
1.....	.682	.750	.818	.886	.995	1.02	1.09	1.16	1.23	1.30
2.....	1.36	1.43	1.50	1.57	1.64	1.70	1.77	1.84	1.91	1.98
3.....	2.05	2.11	2.18	2.25	2.32	2.39	2.45	2.52	2.59	2.06
4.....	2.73	2.80	2.86	2.93	3.00	3.07	3.14	3.20	3.27	3.34
5.....	3.41	3.48	3.55	3.61	3.68	3.75	3.82	3.89	3.95	4.02
6.....	4.09	4.16	4.23	4.30	4.36	4.43	4.50	4.57	4.64	4.70
7.....	4.77	4.84	4.91	4.98	5.05	5.11	5.18	5.25	5.32	5.39
8.....	5.45	5.52	5.59	5.66	5.73	5.80	5.86	5.93	6.00	6.07
9.....	6.14	6.20	6.27	6.34	6.41	6.48	6.55	6.61	6.68	6.75

1 second-foot equals 40 California miner's inches (law of Mar. 23, 1901).

1 second-foot equals 38.4 Colorado miner's inches.

1 second-foot equals 40 Arizona miner's inches.

1 second-foot equals 7.48 United States gallons per second; equals 448.8 gallons per minute; equals 646,317 gallons for one day.

1 second-foot for one year (365 days) covers 1 square mile 1.131 feet, or 13.752 inches deep.

1 second-foot for one year (365 days) equals 31,536,000 cubic feet.

1 second-foot equals about 1 acre-inch per hour.

1 second-foot for one year (365 days) equals 724 acre-feet.

1 second-foot for one day equals 86,400 cubic feet.

1,000,000,000 (1 United States billion) cubic feet equals 11,570 second-feet for one day.

1,000,000,000 cubic feet equals 414 second-feet for one 28-day month.

1,000,000,000 cubic feet equals 399 second-feet for one 29-day month.

1,000,000,000 cubic feet equals 386 second-feet for one 30-day month.

1,000,000,000 cubic feet equals 373 second-feet for one 31-day month.

100 California miner's inches equals 18.7 United States gallons per second.

100 California miner's inches for one day equals 4.96 acre-feet.

100 Colorado miner's inches equals 2.60 second-feet.

100 Colorado miner's inches equals 19.5 United States gallons per second.

100 Colorado miner's inches for one day equals 5.17 acre-feet.

100 United States gallons per minute equals 0.223 second-foot.

100 United States gallons per minute for one day equals 0.442 acre-foot.

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1,000,000 United States gallons per day equals 1.55 second-feet.
1,000,000 United States gallons equals 3.07 acre-feet.
1,000,000 cubic feet equals 22.95 acre-feet.
1 acre-foot equals 325,850 gallons.
1 inch deep on 1 square mile equals 2,323,200 cubic feet.
1 inch deep on 1 square mile equals 0.0737 second-foot per year.
1 foot equals 0.3048 meter.
1 mile equals 1.60935 kilometers.
1 mile equals 5,280 feet.
1 acre equals 0.4047 hectare.
1 acre equals 43,560 square feet.
1 acre equals 209 feet square, nearly.
1 square mile equals 2.59 square kilometers.
1 cubic foot equals 0.0283 cubic meter.
1 cubic foot of water weighs 62.5 pounds.
1 cubic meter per minute equals 0.5886 second-foot.
1 horsepower equals 550 foot-pounds per second.
1 horsepower equals 76 kilogram-meters per second.
1 horsepower equals 746 watts.
1 horsepower equals 1 second-foot falling 8.80 feet.
1½ horsepower equals about 1 kilowatt.

To calculate water power quickly: $\frac{\text{Second-feet} \times \text{fall in feet}}{11}$ = net horsepower on water wheel realizing 80 per cent of theoretical power.

EXPLANATION OF DATA.

The data presented in this report cover the year beginning October 1, 1913, and ending September 30, 1914. At the first of January in most parts of the country a large amount of the precipitation for the preceding three months is stored either as ground water, in the form of snow, or in lakes. This stored water passes off in the streams during the spring break-up. At the end of September the only stored water available for run-off in the streams is possibly a small amount held in ground storage. Therefore the run-off for a year beginning with October 1 is practically all derived from preciptation occurring within that year.

The base data collected at gaging stations (Pl. I, *B*) consist of records of stage, measurements of discharge, and general information used to supplement the gage heights and discharge measurements in determining the daily flow. The records of stage are obtained either from direct readings on a staff gage or from a water-stage recorder (Pl. II) that gives a continuous record of the fluctuations. Measurements of discharge are made with a current meter or by the general methods outlined in standard text-books on the measurement of river discharge.

From the discharge measurements rating tables are prepared that give the discharge for any stage, and these rating tables, when applied to the gage heights give the daily discharge from which the monthly and yearly mean discharge is determined.

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The data presented for each regular gaging station comprise a description of the station, a table giving results of discharge measurements, a table showing the daily discharge of the stream, and a table of monthly and yearly discharge and run-off.

If the base data are insufficient to determine the daily discharge, tables giving daily gage heights and results of discharge measurements are published.

The description of the station gives, in addition to statements regarding the location and equipment, information in regard to any conditions that may affect the constancy of the stage-discharge relation, covering such subjects as the occurrence of ice, the use of the stream for log driving, shifting of control, and the cause and effect of backwater; it gives also information as to diversions that decrease the flow at the gage, artificial regulation, maximum and minimum recorded stages, and the accuracy of the results.

The table of daily discharge gives the discharge in second-feet corresponding to the mean of the gage heights read each day. At stations subject to sudden or rapid diurnal fluctuation the discharge obtained from the rating table and the mean daily gage height may not be the true mean discharge for the day. If such stations are equipped with water-stage recorders, the mean daily discharge may be obtained by computing the mean daily gage height and applying it to the rating table, by averaging discharge at regular intervals during the day, or by use of the discharge integrator—an instrument operating on the principle of the planimeter and containing as an essential element the rating curve of the station.

In the table of monthly discharge the column headed "Maximum" gives the mean flow for the day when the mean gage height was highest. As the gage height is the mean for the day, it does not indicate correctly the stage when the water surface was at crest height and the corresponding discharge was consequently larger than given in the maximum column. Likewise, in the column of "Minimum" the quantity given is the mean flow for the day when the mean gage height was lowest. The column headed "Mean" is the average flow in cubic feet for each second during the month. On this average flow the computations recorded in the remaining columns which are defined on page 10, are based.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of stream-flow data depends primarily (1) on the permanence of the stage-discharge relation and (2) on the accuracy of observation of stage, measurements of flow, and interpretation of records.

Footnotes added to the daily discharge tables give information regarding the probable accuracy of the rating tables used, and a

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accuracy column is inserted in the monthly discharge table. For the rating tables, "well-defined" indicates, in general, that the rating is probably accurate within 5 per cent; "fairly well defined," within 10 per cent; "poorly defined" or "approximate" within 15 to 25 per cent. These notes are very general and are based on the plotting of the individual measurements with reference to the mean rating curve.

The letter in the column headed "Accuracy," in the monthly discharge table rates the accuracy of the monthly mean and not that of the estimate of maximum or minimum discharge or the discharge for any one day. The rating is determined by considering the accuracy of the rating curve, the probable reliability of the observer, the number of gage readings per day, the range of the fluctuation in stage, and local conditions. In this column A indicates that the mean monthly flow is probably accurate within 5 per cent; B, within 10 per cent; C, within 15 per cent; D, within 25 per cent. Special conditions are covered by footnotes.

The monthly means for any station may represent with high accuracy the quantity of water flowing past the gage, but the figures showing discharge per square mile and depth of run-off in inches may be subject to gross errors caused by the inclusion of large noncontributing districts in the measured drainage area, by lack of information concerning water diverted for irrigation or other use, or by inability to interpret the effect of artificial regulation of the flow of the river above the station. "Second-feet per square mile" and "run-off (depth in inches)" are therefore not computed if such errors appear probable. The computations are also omitted for streams draining areas in which the annual rainfall is less than 20 inches. All figures representing "second-feet per square mile" and "run-off (depth in inches)" previously published by the Survey should be used with caution because of possible inherent sources of error not known to the Survey.

The table of monthly discharge gives only a general idea of the flow at the station and should not be used for other than preliminary estimates; the tables of daily discharge allow more detailed studies of the variation in flow. It should be borne in mind, however, that the observations in each succeeding year may be expected to throw new light on data already collected and published.

COOPERATION.

The water resources investigation of the United States Geological Survey in California is being carried on in cooperation with the State in accordance with acts of the State legislature approved March 16, 1903, March 20, 1905, March 11, 1907, and April 22, 1909, empowering the State authorities to enter into contracts with the Director of the United States Geological Survey for the purpose of making

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topographic maps, gaging streams, and surveying reservoir sites and canal locations for the conservation and utilization of the flood and storm waters of the State. The work for the year 1913–14 was maintained in accordance with the contract approved by the State board of control and signed by W. F. McClure, State engineer.

Additional funds for the maintenance of gaging stations were furnished by the conservation commission and the State water commission. The members of the conservation commission are George C. Pardee, chairman; Francis Cuttle, and J. P. Baumgartner. The members of the State water commission are Hiram W. Johnson, governor; Charles D. Marx, chairman; S. C. Graham, Harold T. Power, and W. F. McClure, State engineer.

The stream-flow investigations for the Hetch Hetchy project, formerly conducted by the city of San Francisco, were taken over by the United States Geological Survey May 1, 1914. The entire expense of this work is paid directly by the city and county of San Francisco, through M. M. O'Shaugnessy, city engineer.

Many complete estimates of run-off, gage-height records, and discharge measurements are furnished by various Federal bureaus, private companies, and individuals who are interested in the water resources of California. This cooperation is acknowledged and explained in the descriptions that precede the records.

The work in Oregon was carried on under a cooperative agreement with the State, through John H. Lewis, State engineer.

Acknowledgment is due to the Goose Lake Valley Irrigation Co., Hunter Land Co., and the Rogue River Valley Canal Co. for financial assistance in collecting data. The United States Reclamation Service and the United States Indian Service have furnished data for stations in the Klamath River basin, which has been acknowledged in the descriptions of the stations.

DIVISION OF WORK.

The data for stations in California were collected and prepared for publication under the direction of H. D. McGlashan, district engineer, by F. C. Ebert, Lasley Lee, Charles Leidl, R. C. Rice, C. P. Firestone, W. V. Hardy, H. J. Tompkins, J. H. Morgan, and M. B. Trelease.

The data for stations in Oregon were collected and prepared for publication under the direction of F. F. Henshaw, district engineer; by J. E. Stewart, C. L. Batchelder, P. V. Hodges, and J. L. McAlister.

The manuscript was assembled by H. J. Dean.

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GAGING-STATION RECORDS.

TIA JUANA RIVER BASIN.

COTTONWOOD CREEK NEAR DULZURA,[1] CAL.

LOCATION.—In the SW. ¼ sec. 15, T. 17 S., R. 3 E., at Barrett dam site, 1½ miles below intake of Dulzura conduit, about 17 miles northeast of Dulzura. Pine Valley Creek enters 1 mile and Lyons Creek half a mile above the station.

DRAINAGE AREA.—246 square miles (revised estimate, measured on military survey and United States Geological Survey topographic maps).

RECORDS AVAILABLE.—December 15, 1905, to September 30, 1914.

GAGE.—Two vertical staffs. Upper gage is on left bank near end of dam and indicates depth of water on the crest; lower gage, which is on upstream side of dam between flume and right bank, is read when no water is flowing over crest of dam; its datum is 2.50 feet lower than that of the upper gage. The upper gage was not used during 1912 and 1913.

CHANNEL AND CONTROL.—Shifting sand above dam; control is a low concrete dam back of which sand and gravel have been deposited to the level of its crest. At low stages the flow is restricted to a rectangular wooden flume through the wall of the dam, but at high stages the flow is over the entire length of the dam, which is 61 feet.

EXTREMES OF DISCHARGE.—1905–1914: Maximum mean daily discharge, 5,800 second-feet March 24, 1906; channel dry for long periods every year since 1909.

DISCHARGE MEASUREMENTS.—Made by wading except at high stages, when float measurements only have been made.

DIVERSIONS.—Dulzura conduit diverts water from Cottonwood and Pine Valley creeks, about half a mile above their junction, into the Dulzura Creek drainage basin. From the end of the conduit the water flows down the natural channel of Dulzura Creek into the Lower Otay reservoir. The water is used for municipal supply at San Diego. The conduit is 13.38 miles long and is concrete lined except 4,490 feet of flume and 9,219 feet of tunnel. The average width is about 5 feet and the depth 4 feet 2 inches. The grade is 4 feet in 5,000 and the capacity 40,000,000 gallons in 24 hours. The seepage loss between intake and measuring weir is estimated at about 3 per cent.

STORAGE.—The Morena reservoir, about 9 miles above the Barrett dam site, has a capacity of 46,000 acre-feet. On October 1, 1914, there wre 3,820 acre-feet impounded in the reservoir.

ACCURACY.—Daily discharge computed by city of San Diego from rating curve prepared by United States Geological Survey; results apparently good.

COOPERATION.—Estimates of daily discharge furnished by the department of water, city of San Diego, through George Cromwell, city engineer.

No discharge measurements were made during the year.

[1] Published formerly as "near Jamul."

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Daily discharge, in second-feet, of Cottonwood Creek near Dulzura, Cal., for the ending Sept. 30, 1914.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Ju
1	.....	2.0	1.2	2.0	2.0	1.1	1.7	
2	.....	2.0	1.2	2.0	2.0	1.1	1.7	
3	.....	1.7	2.0	2.0	1.7	1.1	1.4	
4	.....	1.7	1.4	1.7	1.7	1.1	1.2	
5	.....	1.8	1.1	1.7	1.5	1.1	1.1	
6	.....	1.8	1.1	1.7	1.4	1.1	1.0	
7	.....	1.7	1.1	1.7	1.4	1.1	1.0	
8	.....	1.7	1.1	1.7	1.4	1.1	1.0	
9	.....	1.6	1.1	1.7	1.4	1.1	1.0	
10	.....	1.6	1.1	1.4	1.4	1.1	1.0	
11	.....	1.6	1.1	1.4	1.4	1.1	1.0	
12	.....	1.7	1.1	1.4	1.4	1.1	1.0	
13	.....	1.7	1.1	1.4	1.4	1.0	1.0	
14	.....	1.8	1.1	1.4	1.4	1.0	1.0	
15	.....	1.8	1.1	1.4	1.4	1.0	1.0	
16	.....	1.8	1.7	1.4	1.4	1.0	1.0	
17	.....	1.8	1.7	1.5	1.1	1.0	1.0	
18	.....	1.4	2.0	1.5	1.1	.8	.8	
19	0.7	1.1	2.0	13	1.1	.7	.7	
20	.7	1.1	1.7	19	1.1	.6	.7	
21	1.6	1.2	1.7	429	1.1	.6	.7	
22	1.7	1.4	1.4	202	1.1	.7	.7	
23	1.2	1.6	1.4	30	1.1	1.2	.7	
24	1.1	1.4	1.4	6.8	1.1	1.2	.7	
25	1.1	1.4	1.4	3.4	1.1	1.1	.7	
26	1.1	1.4	2.4	2.6	1.6	1.1	.7	
27	1.2	1.4	6.3	2.3	1.4	1.0	.7	
28	1.2	1.2	52	2.0	1.1	1.0	.7	
29	1.2	1.2	3.4	.....	1.1	1.4	.7	
30	1.5	1.2	2.0	.....	1.1	1.7	1.1	
31	.....	1.2	2.0	.....	1.1	.....	1.1	

NOTE.—No flow in creek Oct. 1 to Nov. 17, 1913, and June 27 to Sept. 30, 1914.

Monthly discharge of Cottonwood Creek near Dulzura, Cal., for the year ending S 30, 1914.

Month.	Discharge in second-feet.			Run- (total acre-fe
	Maximum.	Minimum.	Mean.	
October	0.0	0.0	0.00	
November	1.7	.0	.51	
December	2.0	1.1	1.55	
January	52	1.1	3.30	
February	429	1.4	26.4	
March	2.0	1.1	1.34	
April	1.7	.6	1.04	
May	1.7	.7	.96	
June	2.0	.0	.61	
July	.0	.0	.00	
August	.0	.0	.00	
September	.0	.0	.00	
The year	429	.0	2.81	

NOTE.—Monthly and yearly discharge computed by engineers of U. S. Geological Survey.

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Combined daily discharge, in second-feet, of Cottonwood Creek and Dulzura conduit near Dulzura, Cal., for the year ending Sept. 30, 1914.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	.....	2.0	4.8	13.3	22	13.0	13.6	1.1
2	.....	2.0	4.1	11.9	19.8	10.3	14.3	1.1
3	.....	1.7	2.0	11.2	18.9	8.9	12.1	1.0
4	.....	1.7	1.4	9.5	17.5	8.3	9.4	.7
5	.....	1.8	3.5	8.9	15.6	8.3	8.3	.7
6	.....	1.8	2.9	8.3	14.6	8.9	7.6	.7
7	.....	1.7	2.9	8.3	13.6	8.3	6.3	.7
8	.....	1.7	2.9	7.6	13.3	7.7	6.3	2.0
9	.....	1.6	2.9	7.0	12.1	7.0	5.2	2.0
10	.....	1.6	2.9	6.7	12.1	6.4	5.2	2.0
11	.....	1.6	2.9	6.7	12.1	8.3	5.2	1.4
12	.....	1.7	2.9	6.2	10.6	7.7	5.2	.7
13	.....	1.7	2.9	5.6	10.6	6.3	4.6	.6
14	.....	1.8	2.9	5.6	9.9	5.2	5.2	.5
15	.....	1.8	2.9	5.0	9.2	5.2	5.5	.4
16	.....	1.8	7.0	3.5	9.2	4.6	5.2	.2
17	.....	1.8	7.6	9.3	8.9	3.8	4.6	.2
18	0.7	1.4	6.2	6.8	7.7	3.6	3.6	.2
19	.7	1.1	7.9	48	7.7	3.1	2.5	.2
20	1.6	1.1	7.0	65	7.7	2.4	2.1	.4
21	1.7	3.6	5.9	477	7.7	1.8	1.4	.3
22	1.2	3.2	5.6	240	7.7	7.3	.9	.3
23	1.1	6.4	5.0	76	7.7	14.4	.7	.3
24	1.1	5.6	5.6	48.8	8.3	18.4	.7	.2
25	1.1	5.0	5.6	38.4	8.9	38	.7	.2
26	1.1	5.6	7.7	32.6	9.4	19.5	1.1	.1
27	1.2	5.0	24.1	26.3	11.3	10.2	1.1	.....
28	1.2	4.1	94	24	11.0	8.2	.7	.....
29	1.2	3.0	33.4	.....	11.8	9.2	.7	.....
30	1.5	3.8	19.8	.....	14.3	10.9	1.1	.....
31	.....	4.4	15.8	.....	14.3	.....	1.1	.....

NOTE.—No flow Oct. 1 to Nov. 17, 1913, and June 27 to Sept. 30, 1914.

Monthly discharge of Cottonwood Creek and Dulzura conduit near Dulzura, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	0.0	0.0	0.00	0
November	1.7	.0	.51	30
December	6.4	1.1	2.68	165
January	94	1.4	9.77	601
February	477	3.5	43.5	2,420
March	22	7.7	11.8	726
April	38	1.8	9.17	546
May	14.3	.7	4.59	282
June	2.0	.0	.61	36
July	.0	.0	.00	0
August	.0	.0	.00	0
September	.0	.0	.00	0
The year	477	.0	6.63	4,810

NOTE.—Monthly and yearly discharge computed by engineers of the U. S. Geological Survey.

DULZURA CONDUIT[1] NEAR DULZURA, CAL.

LOCATION.—About 12 miles below intake and 2 miles southeast of Dulzura. During 1909 and 1910 station was 1½ miles below intake.

RECORDS AVAILABLE.—January 1, 1909, to September 30, 1914.

GAGE.—Lietz water-stage recorder at weir.

[1] Published formerly as "near Jamul." For description of conduit see Cottonwood Creek near Dulzura, "Diversions," p. 17.

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DISCHARGE.—Computed from gage-height record at an 8-foot steel-plate weir a 1¼ miles above lower end of conduit.

ACCURACY.—Water-stage recorder is checked twice each day by patrolman; re apparently good.

COOPERATION.—Estimates of daily discharge furnished by department of water, of San Diego, through George Cromwell, city engineer.

Daily discharge, in second-feet, of Dulzura conduit near Dulzura, Cal., for the year en Sept. 30, 1914.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	M
1		3.6	11.3	20	11.9	
2		2.9	9.9	17.8	9.2	
3			9.2	17.2	7.8	
4			7.8	15.8	7.2	
5		2.4	7.2	14.1	7.2	
6		1.8	6.6	13.2	7.8	
7		1.8	6.6	12.2	7.2	
8		1.8	5.9	11.9	6.6	
9		1.8	5.3	10.7	5.9	
10		1.8	5.3	10.7	5.3	
11		1.8	5.3	10.7	7.2	
12		1.8	4.8	9.2	6.6	
13		1.8	4.2	9.2	5.3	
14		1.8	4.2	8.5	4.2	
15		1.8	3.6	7.8	4.2	
16		5.3	2.1	7.8	3.6	
17		5.9	7.8	7.8	2.8	
18		4.2	5.3	6.6	2.8	
19		5.9	35	6.6	2.4	
20		5.3	46	6.6	1.8	
21	2.4	4.2	48	6.6	1.2	
22	1.8	4.2	38	6.6	6.6	
23	4.8	3.6	46	6.6	13.2	....
24	4.2	4.2	42	7.2	17.2	....
25	3.6	4.2	35	7.8	36.9	....
26	4.2	5.3	30	7.8	18.4	
27	3.6	17.8	24	9.9	9.2	
28	2.9	42	22	9.9	7.2	....
29	1.8	30	.....	10.7	7.8	....
30	2.6	17.8	.....	13.2	9.2	....
31	3.2	13.8	.....	13.2	.....	....

NOTE.—No flow on days for which discharge is not given.

Monthly discharge of Dulzura conduit near Dulzura, Cal., for the year ending Sept. 1914.

Month	Discharge in second-feet.			Run- (total acre-fe
	Maximum.	Minimum.	Mean.	
October	0.0	0.0	0.00	
November	.0	.0	.00	
December	4.8	.0	1.13	
January	42	.0	6.47	
February	48	2.1	17.1	
March	20	6.6	10.4	
April	36.9	1.2	8.13	
May	12.6	.0	3.63	
June	.0	.0	.00	
July	.0	.0	.00	
August	.0	.0	.00	
September	.0	.0	.00	
The year	48	.0	3.82	

NOTE.—Monthly and yearly discharge computed by engineers of the U. S. Geological Survey.

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SWEETWATER RIVER BASIN.

SWEETWATER RIVER NEAR DESCANSO, CAL.

LOCATION.—In the SE. ¼ sec. 25, T. 15 S., R. 3 E., at Ellis ranch, 2 miles below mouth of Guatay Creek and about 1½ miles below Descanso.

DRAINAGE AREA.—43.7 square miles (revised estimate; measured on military survey and United States Geological Survey topographic maps).

RECORDS AVAILABLE.—November 21, 1905, to September 30, 1914.

GAGE.—Staff in three sections on left bank. Observer, C. H. Ellis.

DISCHARGE MEASUREMENTS.—Made from cable at gage or by wading.

CHANNEL AND CONTROL.—Sand and gravel; shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.50 feet at 5 p. m. February 21 (discharge, computed from extension of rating curve, 595 second-feet); minimum stage recorded, 3.2 feet July 4 to August 1 (discharge estimated at 0.05 second-foot).

1906–1914: Maximum stage recorded, 9.25 feet at 5 p. m. March 24, 1906 (approximate discharge, computed from extension of rating curve, 3,000 second-feet); no flow during parts of 1910, 1911, and 1913.

DIVERSIONS.—A small irrigation ditch (capacity, about one-third second-foot) heads about 1,000 feet above station.

ACCURACY.—Discharge computed from curves covering short periods and by indirect method for shifting channels; results fair.

Discharge measurements of Sweetwater River near Descanso, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 3	F. C. Ebert	3.36	[a] 0.05	Mar. 24	H. D. McGlashan	3.67	4.4
Feb. 1	do	3.89	6.8	Apr. 19	F. C. Ebert	3.52	1.8
1	W. E. Keenan	3.89	6.8	May 12	do	3.58	2.6
Mar. 3	F. C. Ebert	3.91	10	Aug. 21	do	3.24	[a] .05

[a] Estimated.

Daily discharge, in second-feet, of Sweetwater River near Descanso, Cal., for the year ending Sept. 30, 1914.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	0.1	5.5	16	9.5	9.5	0.4
2	.1	4.5	14	8	9.5	.4
3	.1	4.5	12	7	9.5	.4
4	.1	4.5	12	7	8	.4
5	.1	3.5	11	6	7	.4
6	.1	3.5	9.5	6	6	.2
7	.1	3	8	6	5	.4
8	.1	3	7	5.5	4	.2
9	.05	3	7	5.5	4	.2
10	.05	3	7	5	3	.2
11	.05	3	7	5	3	.2
12	.05	3	6	4.5	2	.2
13	.05	3	6	4.5	2	.2
14	.05	2	5	4.5	2	.2
15	.1	2	5	4	2	.2
16	2	2	4	4	2	.2
17	.9	3.5	4	3.5	2	.2
18	1.5	3.5	4	3.5	2	.2
19	2	59	3	3	2	.2
20	.9	45	3	3	1.5	.2
21	.9	380	2	4	1.5	.2
22	.5	148	2	12	1.5	.2
23	.5	115	2	9.5	1.5	.2
24	.9	14	3	6	1.5	.05
25	6.5	42	5	5	1.5	.05
26	94	36	6	5	1.5	.05
27	350	27	7	5	1	.05
28	45	23	8	4	1	.05
29	23	.....	8	9.5	1	.05
30	13	.....	14	9.5	.5	.05
31	9	.....	9.5	.....	.5	.....

NOTE.—Discharge determined from several fairly well defined rating curves and by indirect method for shifting channels. Discharge Oct. 1 to Dec. 31 and July 1 to Sept. 30 very small, derived mostly from springs. See monthly table and remarks under accuracy in station description.

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Monthly discharge of Sweetwater River near Descanso, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	.....	.....	a0.10	6	
November	.....	.....	a.17	10	
December	.....	.....	a.11	7	
January	350	0.05	17.8	1,090	C.
February	380	2	33.9	1,880	C.
March	16	2	7.00	430	B.
April	12	3	5.82	346	B.
May	9.5	5	3.19	196	B.
June	.4	.05	.205	12	
July	.....	.....	a.05	3	
August	.....	.....	a.05	3	
September	.....	.....	a.05	3	
The year	.....	.....	5.52	3,990	

a Estimated.

SWEETWATER RIVER NEAR DEHESA, CAL.

LOCATION.—In the NW. ¼ NW. ¼ sec. 20, T. 16 S., R. 2 E., 1,000 feet below mouth of Lawson Creek and about 3 miles southeast of Dehesa.

DRAINAGE AREA.—112 square miles (measured on military survey and United States Geological Survey topographic maps).

RECORDS AVAILABLE.—December 4, 1913, to September 30, 1914.

GAGE.—Bristol water-stage recorder on left bank 100 feet above control, and vertical staff gage, in two sections, bolted to solid rock at same location; gage height indicates depth of water on control.

DISCHARGE MEASUREMENTS.—Made from cable 300 feet below gage or by wading.

CHANNEL AND CONTROL.—Channel shifting sand overlying solid rock; concrete control extending to bedrock.

EXTREMES OF DISCHARGE.—Maximum stage during year, from automatic gage record, 3.4 feet February 21 (discharge, 725 second-feet); minimum stage from recorder, 0.04 foot (estimated discharge less than 0.05 second-foot).

ACCURACY.—Rating curve fairly well defined; results good.

COOPERATION.—Station maintained in cooperation with Sweetwater Water Co., through John F. Covert, engineer.

Discharge measurements of Sweetwater River near Dehesa, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 30	Charles Fulton	0.90	20	Mar. 7	F. C. Ebert	0.80	10
Feb. 22	J. F. Covert	2.30	179	11	Charles Fulton	.75	9.1
23	Charles Fulton	1.80	87	25	J. F. Covert	.68	5.5

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aily discharge in second-feet of Sweetwater River near Dehesa, Cal., for the year ending Sept. 30, 1914.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	.....	0.8	18	23	6.8	14	2.5	0.2	0.05
2	.....	1.1	16	20	6.0	12	2.5	.2	.05
3	.....	1.3	14	18	6.0	11	2.3	.2	.1
4	0.3	1.3	12	17	6.8	9.4	1.7	.2	.1
5	.4	1.1	10	15	6.8	8.1	1.2	.1	.1
6	.6	1.1	10	12	7.4	6.8	1.5	.1	.1
7	.6	1.3	9.4	10	6.8	6.8	1.8	.1	.1
8	.6	1.3	8.4	10	7.1	6.5	2.5	.1	.1
8	.4	1.4	7.4	10	9.4	6.8	2.1	.1	.1
10	.4	1.4	7.4	10	11	6.8	1.7	.1	.1
11	.3	1.3	6.8	8.7	11	6.5	1.3	.1	.1
12	.4	1.2	6.5	8.1	8.4	6.5	1.0	.1	.1
13	.4	1.4	7.8	8.1	6.8	6.3	.8	.1	.1
14	.4	1.1	8.7	8.1	6.8	5.2	.7	.1	.05
15	.4	1.3	7.4	7.8	6.8	5.8	.5	.05	.05
16	.4	2.4	6.3	7.4	6.8	6.8	.4	.05	.05
17	.4	6.8	6.5	6.8	8.1	7.4	.3	.05	.05
18	.3	6.8	9.4	6.8	11	7.4	.3	.05	.0
19	.3	10	64	6.8	11	6.3	.3	.05	.0
20	.3	6.8	87	6.8	8.4	4.7	.3	.05	.0
21	.4	5.0	237	7.4	7.8	4.2	.3	.05	.05
22	.5	4.2	207	8.1	8.1	4.2	.3	.05	.05
23	.6	4.5	91	6.8	10	4.2	.3	.05	.05
24	.4	5.0	57	6.3	8.7	3.9	.3	.05	.05
25	.4	5.5	41	6.3	8.1	3.9	.3	.05	.05
26	.4	23	28	9.7	7.8	3.7	.2	.05	.1
27	.4	281	26	7.8	6.8	2.4	.2	.05	.1
28	.4	110	26	10	10	3.4	.2	.05	.1
29	.4	24	.....	8.7	10	3.2	.2	.05	.1
30	.4	16	.....	14	11	3.0	.2	.05	.05
31	.5	15	.....	10	.....	2.5	.....	.05	.05

NOTE.—Discharge determined from a curve fairly well defined below 300 second-feet. Discharge for September estimated at 0.05 second-foot.

Monthly discharge of Sweetwater River near Dehesa, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
December 4-31	0.6	0.3	0.42	23	
January	281	.8	17.5	1,080	B.
February	237	6.3	37.0	2,050	B.
March	23	6.3	10.2	627	B.
April	11	6	8.25	491	B.
May	14	2.5	6.15	378	C.
June	2.5	.2	.94	56	
July	.2	.05	.085	5	
August	.1	.0	.069	4	
September	.....	.....	[a].05	3	
The period	.....	.....	.....	4,720	

[a] Estimated.

SAN DIEGO RIVER BASIN.

SAN DIEGO RIVER AT DIVERTING DAM NEAR LAKESIDE, CAL.

LOCATION.—In the NE. ¼ NE. ¼ sec. 11, T. 14 S., R. 2 E., at diverting dam for San Diego flume, about 1,000 feet below mouth of Boulder Creek and 13 miles northeast of Lakeside.

DRAINAGE AREA.—102 square miles (measured on topographic map).

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RECORDS AVAILABLE.—October 1, 1912, to September 30, 1914.

GAGE.—Friez water-stage recorder on left bank at dam. A vertical staff is fastened on outside of gage well.

DISCHARGE MEASUREMENTS.—Made from cable one-fourth mile below dam or by wading.

CHANNEL AND CONTROL.—Shifting sand above and below dam.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year and for period 1913–14, 11.6 feet at 4 and 8 a. m. January 27 (discharge, computed from extension of rating curve, 2,380 second-feet); no flow over dam for more than half the year.

STORAGE.—See "Boulder Creek at Cuyamaca reservoir, near Julian."

ACCURACY.—Rating curve well defined except for high stages; results good.

COOPERATION.—Station maintained in cooperation with Cuyamaca Water Co., through W. S. Post, engineer.

Discharge measurements of San Diego River at diverting dam near Lakeside, Cal., during the year ending Sept. 30, 1914.

[Made by F. C. Ebert.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Jan. 20	9.62	11
28	10.08	16

Daily discharge, in second-feet, of San Diego River over diverting dam near Lakeside, Cal., for the year ending Sept. 30, 1914.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1			12	28		19	
2			3	23		23	
3				19		10	
4				15		2	
5				17		(a)	
6			(a)	4			
7			2	(a)			
8				(a)		4	0.5
9						4	
10						.5	
11					3		
12						.5	
13							
14		1				2	
15		4				2	
16		8				2	
17	1	10				2	
18		12		.5		2	
19		17	295	1			
20		15	135				
21		9	1,260				
22		8	425				
23	.5	8	255		28		
24		12	117		1		
25		15	72				
26	(a)	190	50				
27	(a)	925	36				
28		135	31	10			
29		55		1	4		
30		31		19	33		
31		14		1			

a Discharge for day less than one-half second-foot.

NOTE.—Discharge determined from a rating curve well defined below 400 second-feet. No flow over dam days for which discharge is not given.

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nthly discharge of San Diego River over diverting dam near Lakeside, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (in total acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
ber	0	0	0	0	
mber	0	0	0	0	
mber	1	0	.05	3	
ary	925	0	47.4	2,910	B.
uary	1,260	0	96.2	5,340	B.
h	28	0	4.47	275	B.
l	28	0	2.3	137	B.
	23	0	2.35	144	B.
	.5	0	.01	.6	
	0	0	0	0	
ust	0	0	0	0	
ember	0	0	0	0	
The year	1,260	0	12.2	8,810	

al daily discharge, in second-feet, of San Diego River[a] at diverting dam near Lakeside, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	3.5	0.0	[b]5.5	31	56	22	32	5.5	0.0	4.1	3.8
.....	2.5	.0	[b]8.3	22	51	19	37	5.5	.0	3.2	3.8
.....	2.1	[b]4.0	[b]4.3	19	47	16	30	5.5	.0	2.4	3.5
.....	2.3	.0	[b]5.9	19	43	15	27	5.7	.0	3.2	3.5
.....	2.2	.0	[b]12	15	45	14	24	5.7	.0	3.9	2.8
.....	2.4	.0	[b]9.5	16	32	15	23	5.1	.0	2.9	3.2
.....	2.5	[b]0	.0	18	26	17	14	3.9	.0	4.3	3.0
.....	2.3	[b]4.6	.0	8.7	25	17	15	12	.0	3.9	3.6
.....	1.4	.6	.0	11	24	14	16	9.6	5.0	3.5	3.3
.....	2.8	.0	.0	11	25	14	16	11	3.0	3.2	2.1
.....	2.7	.0	.0	11	24	17	14	6.4	2.0	2.4	1.5
.....	2.4	.0	[b]1.0	11	23	14	14	3.8	3.5	2.4	1.9
.....	2.0	[b]3.0	[b]1.0	13	23	14	12	6.2	4.6	3.2	1.9
.....	2.2	.6	1.0	12	19	13	13	3.8	4.3	3.2	2.0
.....	2.7	.0	4.0	11	18	12	13	4.7	4.4	3.0	2.3
.....	2.3	.0	8.0	9.4	20	11	14	3.3	4.6	3.2	2.3
.....	2.4	[b]4.4	10	7.8	18	11	13	.1	4.6	3.3	2.1
.....	2.4	.9	12	11	16	11	15	.0	3.0	3.3	2.0
.....	2.4	.0	17	302	17	6.0	9.1	.0	3.3	3.3	1.9
.....	2.2	[b]3.1	16	145	16	6.4	8.3	.0	3.8	3.8	1.4
.....	2.6	.6	9.0	1,260	15	7.2	7.4	.0	3.0	3.8	1.2
.....	1.6	[b]6.9	9.2	444	15	12	7.8	.0	3.0	3.9	1.5
.....	1.3	[b]24	8.0	279	14	49	7.6	.0	2.9	3.8	1.8
.....	1.2	3.8	12	145	15	28	7.8	.0	2.6	3.2	1.8
.....	.5	.0	15	94	14	26	7.8	.0	2.8	3.2	1.8
.....	.2	[b]4.1	190	79	14	19	8.3	.0	2.6	3.6	1.6
.....	.0	[b]20	925	64	17	16	7.4	.0	2.8	3.5	1.6
.....	.0	3.0	143	59	27	15	7.6	.0	2.8	3.5	1.4
.....	.6	[b]13	73	.....	23	20	7.0	.0	2.8	3.2	1.8
.....	.5	[b]6.5	50	.....	43	48	6.6	.0	2.9	3.2	1.2
.....	.0	[b]5.5	33	.....	25	.....	5.7	.....	3.3	3.6	.....

Includes flow over dam, through sand-sluice gate, and in flume. For record of discharge of flume see 4.

Sand-sluice gate (36 by 36 inches) in dam open. Discharge through the gate was computed by Mr. S. Post.

OTE.—River practically dry during November.

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Total monthly discharge of San Diego River[a] at diverting dam near Lakeside, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	3.5	0.0	1.81	111
November	.0	.0	.0	0
December	24	.0	3.50	215
January	925	.0	51.1	3,140
February	1,260	7.8	112	6,220
March	56	14	25.5	1,570
April	49	6.0	17.3	1,030
May	37	5.7	14.2	873
June	12	.0	3.26	194
July	5.0	.0	2.50	154
August	4.3	2.4	3.36	207
September	3.8	1.2	2.25	134
The year	1,260	.0	19.1	13,808

[a] Includes flow over dam, through sand-sluice gate, and in flume. For record of discharge of flume see p. 34.

SAN DIEGO RIVER AT LAKESIDE, CAL.

LOCATION.—On the El Cajon grant, just above ford on Lakeside and Padre Barona Valley road, three-fourths mile above Cuyamaca & Eastern Railroad bridge and three-fourths mile north of Lakeside.

DRAINAGE AREA.—203 square miles (revised estimate; measured on topographic map).

RECORDS AVAILABLE.—December 3, 1905, to September 30, 1914.

GAGE.—Staff in three sections on left bank 100 feet above ford. Observer, J. H. Beadle.

DISCHARGE MEASUREMENTS.—Made from cable at gage or by wading.

CHANNEL AND CONTROL.—Shifting sand.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.6 feet at 5 p. m., February 21 (discharge, computed from extension of rating curve, 1,690 second-feet); channel dry October 1 to January 26 and June 24 to September 30.

1906–1914: Maximum stage recorded, gage under water 5 a. m., March 25, 1906 (top of gage at 7.86 feet; approximate discharge, computed from extension of rating curve, 5,200 second-feet); channel dry for long periods every year.

DIVERSIONS.—San Diego flume heads at diverting dam about 1,000 feet below Boulder Creek and 15 miles above the station. Several pumping plants, 1 to 3 miles above the station, obtain water for irrigation from wells along the banks of the stream. Cuyamaca reservoir, on the headwaters of Boulder Creek, has a capacity of 11,400 acre-feet. See also Boulder Creek at Cuyamaca reservoir, page 31.

ACCURACY.—Rating curves fairly well defined; results fair.

Discharge measurements of San Diego River at Lakeside, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 27	F. C. Ebert	4.35	810	Mar. 2	F. C. Ebert	2.43	42
29	do	2.80	95	3	do	2.40	40
31	do	2.37	20	6	do	2.33	29
Feb. 2	do	2.32	12	24	H. D. McGlashan	2.17	1

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Discharge, in second-feet, of San Diego River at Lakeside, Cal., for the year ending Sept. 30, 1914.

	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
...	.....	16	54	10	20	1.5	16.....	.....	0.05	8	2	2.5	.....
...	.....	12	46	10	10	1.5	17.....	.....	1	7	2	2.5	.....
...	.....	10	38	7	10	1.5	18.....	.....	1	6	2	2.5	.....
...	.....	10	32	3	10	1.5	19.....	.....	1	6	1.5	2.5	.....
...	.....	10	32	3	10	1.5	20.....	.....	545	5	1.5	2.5	.....
...	.....	1	25	3	7	1	21.....	.....	908	5	1.5	2.5	.....
...	.....	1	23	3	7	1	22.....	.....	530	4	1.5	2	.....
...	.....	1	21	3	7	1	23.....	.....	322	3	15	2	.....
...	.....	1	17	3	3	1	24.....	.....	364	1.5	7	2	.....
...	.....	1	16	2.5	3	1	25.....	.....	115	1.5	7	2	.....
...	.....	1	14	2.5	3	1	26.....	.....	92	1.5	7	2	.....
...	.....	1	13	2.5	3	.5	27.....	908	72	3	3	2	.....
...	.....	1	12	2.5	3	.5	28.....	392	63	7	3	2	.....
...	.....	1	11	2.5	3	.....	29.....	95	.....	10	3	2	.....
...	.....	.05	8	2	3	.....	30.....	37	.....	10	20	1.5	.....
							31.....	20	.....	10	.....	1.5	.....

s.—Discharge determined from several rating curves and by indirect method for shifting channels. el dry Oct. 1 to Jan. 26, and June 14 to Sept. 30.

hly discharge of San Diego River at Lakeside, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
r.....	0	0	0	0	
iber.....	0	0	0	0	
iber.....	0	0	0	0	
y.....	908	0	46.8	2,880	B.
ary.....	908	.05	110	6,110	C.
.....	54	1.5	14.5	892	C.
.....	20	1.5	4.55	271	D.
.....	20	1.5	4.39	270	D.
.....	1.5	0	.48	29	
.....	0	0	0	0	
t.....	0	0	0	0	
mber.....	0	0	0	0	
The year.....	908	0	14.4	10,500	

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Combined daily discharge, in second-feet, of San Diego River and flume [a] near Lakes Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Se
1	2.0	.....	18	69	26	36	7.7	0.0	5.0	
2	1.8	.....	13	62	27	27	7.7	.0	4.8	
3	.4	.....	11	54	22	27	7.7	.0	3.8	
4	.7	.....	11	48	19	27	7.3	.0	3.8	
5	.8	.....	13	48	19	26	7.1	.0	5.8	
6	.7	.....	8.7	41	20	22	6.6	.0	4.6	
7	.9	.....	11	39	19	21	6.6	.0	5.0	
8	.7	.....	12	37	20	19	6.8	.0	5.8	
9	.2	.....	12	33	18	15	8.5	.0	5.0	
10	.2	.....	12	32	18	19	9.1	4.8	4.0	
11	1.4	.....	13	30	18	17	7.8	2.4	4.4	
12	.7	.....	14	29	18	16	4.0	3.5	3.3	
13	.4	.....	13	28	18	16	5.5	6.0	3.8	
14	.5	.....	13	28	16	15	5.0	6.0	4.4	
15	.7	.....	13	25	15	15	4.2	3.7	5.0	
16	1.0	.....	10	25	15	14	4.2	6.8	5.0	
17	1.0	.....	12	24	14	14	2.8	6.2	5.0	
18	1.4	.....	12	23	14	15	.8	5.2	5.0	
19	1.0	.....	12	23	12	14	.5	5.2	3.7	
20	.9	.....	551	22	8.1	12	.0	5.4	4.4	
21	1.6	.....	922	22	10	12	.0	5.2	5.0	
22	.5	.....	533	21	14	10	.0	5.0	5.0	
23	.0	.....	332	20	29	11	.0	6.0	5.0	
24	.0	.....	378	19	24	10	.0	4.8	4.0	
25	.0	.....	128	19	25	10	.0	5.0	4.2	
26	.0	0.1	107	19	24	11	.0	4.8	4.6	
27	.0	908	87	20	22	11	.0	4.8	4.8	
28	.0	392	78	25	21	10	.0	4.6	4.8	
29	.0	96	.....	28	21	9.7	.0	5.0	5.0	
30	.2	41	.....	25	36	8.5	.0	5.0	3.8	
31	.0	22	.....	25	.....	8.1	.....	5.0	4.4	.....

[a] For record of discharge of flume see p. 36.

NOTE.—No flow during November and December.

Monthly discharge of San Diego River and flume [a] near Lakeside, Cal., for the year end Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-o (total acre-fe
	Maximum.	Minimum.	Mean.	
October	2.0	0.0	0.64	
November	0	0	0	
December	0	0	0	
January	908	0	47.1	2,
February	922	8.7	120	6,
March	69	19	31.1	1,
April	36	8.1	19.4	1,
May	36	8.1	16.1	
June	9.1	0	3.66	
July	6.8	0	3.56	
August	5.8	3.3	4.59	
September	5.4	2.8	3.88	
The year	922	0	20.1	14,

[a] For record of discharge of flume see p. 36.

SAN DIEGO RIVER NEAR SANTEE, CAL.

LOCATION.—At Old Mission dam on tract T, El Cajon grant, just above Oak Cany and about 4½ miles west of Santee.

DRAINAGE AREA.—375 square miles (measured on topographic map).

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RECORDS AVAILABLE.—May 25, 1912, to September 30, 1914.

GAGE.—Staff in three sections; lowest section bolted to upstream face of old dam to the right of the break; remaining sections are on left bank just above dam.

DISCHARGE MEASUREMENTS.—Made from cable about 500 feet above gage or by wading.

CHANNEL AND CONTROL.—Sand; shifting; old dam serves as a part control; a concrete weir, having a steel plate for crest and sides, was installed May 10, 1913, at old break in dam.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year and period 1912–1914, 13.0 feet at 4 p. m., February 21, 1914 (discharge, 2,300 second-feet). Channel dry two-thirds of every year.

DIVERSIONS.—See San Diego River at Lakeside. Water for irrigation is pumped from wells along the river below Lakeside.

ACCURACY.—Rating curve well defined; results excellent for periods covered by gage heights.

COOPERATION.—Station maintained in cooperation with Cuyamaca Water Co., through W. S. Post, engineer, and La Mesa Mutual Water Co., through Dr. Charles Samson, secretary.

Discharge measurements of San Diego River near Santee, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
[illegible]. 27	W. S. Post	12.60	[a] 929	Mar. 6	F. C. Ebert	8.63	49
28	F. C. Ebert	10.35	271	24	do	7.73	2.9
31	do	8.30	23	Apr. 19	do	7.61	[b] 1
[illegible]eb. 2	do	8.00	9.2	May 13	do	7.64	[b] 3
[illegible]ar. 2	do	8.94	69				

[a] Float measurement; coefficient 0.85. [b] Estimated.

Daily discharge, in second-feet, of San Diego River near Santee, Cal., for the year ending Sept. 30, 1914.

Day.	Jan.	Feb.	Mar.	Apr.	May.	Day.	Jan.	Feb.	Mar.	Apr.	May.
1	0.1	18	77	15	.....	16	0.1	0.2	7.6	.....	.....
2	.1	9.7	74	9.7	20	17	.1	.1	7.6	.....	.....
3	.1	9.7	67	6.7	.....	18	.1	.1	7.6	0.2	.....
4	.1	6.7	60	4.1	14	19	.1	.1	5.4	.....	.....
5	.1	5.4	54	3.0	9.7	20	.1	715	5.4	.....	.....
6	.1	4.8	47	2.7	.....	21	.1	2,300	3.2	.....	.....
7	.1	4.1	43	2.4	.....	22	.1	715	3.2	.....	.....
8	.1	4.1	39	2.1	.....	23	.1	418	3.2	.....	.....
9	.1	3.7	35	1.9	.....	24	.1	244	2.3	.....	.....
10	.1	2.0	31	.....	.....	25	.1	150	2.0	.....	.....
11	.1	1.0	27	.....	.....	26	50	110	1.5	.....	.....
12	.1	.5	23	.....	.....	27	930	87	2.0	.....	.....
13	.1	.5	19	.....	.3	28	370	80	4.1	.....	.....
14	.1	.4	15	.....	.....	29	116	.....	6.7	.....	.....
15	.1	.3	11	.....	.....	30	40	.....	9.1	.....	.....
						31	26	.....	20	.....	.....

NOTE.—Discharge determined from a well-defined curve. Discharge estimated by interpolation and comparison with record obtained at San Diego Jan. 1–25; Feb. 6, 9–19, and 25–28; and Apr. 6–8. River was practically dry during October, November, and December, 1913, and June, July, August, and September, 1914.

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Monthly discharge of San Diego river near Santee, Cal., for the year ending Sept. 30, 191

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Acc... rat...
	Maximum.	Minimum.	Mean.		
October	0.0	0.0	0.0	0	
November	.0	.0	.0	0	
December	.0	.0	.0	0	
January	930	.1	49.5	3,040	A.
February	2,300	.1	175	9,720	B.
March	77	1.5	23.0	1,418	B.
June	.0	.0	.0	0	
July	.0	.0	.0	0	
August	.0	.0	.0	0	
September	.0	.0	.0	0	

SAN DIEGO RIVER AT SAN DIEGO, CAL.

LOCATION.—At lower highway bridge, in block 391, Old Town subdivision, city of San Diego, about 1½ miles above mouth.

DRAINAGE AREA.—434 square miles (measured on topographic map).

RECORDS AVAILABLE.—October 1, 1912, to September 30, 1914.

GAGE.—Staff in two sections on left bank just below new concrete bridge. Observer, Harry Lewis.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading.

CHANNEL AND CONTROL.—Shifting sand.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year and for period 1913–14, 16.61 feet at 4 p. m., February 21 (discharge, computed from extension of rating curve, 9,500 second-feet); channel dry more than three-fourths of the year.

DIVERSIONS.—See San Diego River near Santee. Record at this station shows amount of water wasted into Pacific Ocean.

ACCURACY.—Discharge measurements sufficient to insure fairly well defined rating curves; results good.

COOPERATION.—Station maintained in cooperation with Cuyamaca Water Co., through W. S. Post, engineer.

Discharge measurements of San Diego River near San Diego, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 27	W. S. Post	7.56	[a] 111	Feb. 20	Hickok and Keenan	9.15	668
29	F. C. Ebert	7.40	114	Mar. 5	W. E. Keenan	6.67	54
31	W. E. Keenan	6.76	30	8	....do	6.56	37
Feb. 2	F. C. Ebert	6.46	9.8	19	....do	6.25	9.7
3	W. E. Keenan	6.36	5.8	27	F. C. Ebert	6.15	2.4
7	....do	6.18	.2	28	W. E. Keenan	6.20	4.2
17	....do	6.13	[b] 0	May 9	....do	6.13	1.3
19	Taylor and McFadden	6.58	18				

[a] Float measurement; coefficient, 0.90.

[b] Water standing in pools.

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Daily discharge, in second-feet, of San Diego River at San Diego, Cal., for the year ending Sept. 30, 1914.

Day.	Jan.	Feb.	Mar.	Apr.	May.	Day.	Jan.	Feb.	Mar.	Apr.	May.
1		22	82	20		16			13		
2		12	75	18	22	17			9		
3		7	62	13		18			13		
4		4	62	13		19		5	13		
5		2	55	9		20		710	13		
6		1	49	6		21		1,820	13		
7		1	43	3		22		1,350	9		
8		1	38	3		23		422	9		
9			32	1	2	24		234	6		
10			27			25		222	6		
11			22			26		186	6		
12			22			27	237	124	6		
13			18			28	820	90	6		
14			18			29	188		13		
15			13			30	105		18		
						31	34		22		

NOTE.—Discharge determined from two fairly well defined curves May 3–8 and 10–14. Discharge interpolated Apr. 1; discharge Jan. 27 estimated by the hydrographer. No flow Oct. 1 to Jan. 26, Feb. 9–18, Apr. 10 to May 1 and May 15 to Sept. 30.

Monthly discharge of San Diego River at San Diego, Cal., for the year ending Sept, 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0	0	0	0	
November	0	0	0	0	
December	0	0	0	0	
January	820	0	44.6	2,740	C.
February	1,820	0	186	10,300	C.
March	82	6	25.6	1,570	B.
April	20	0	2.9	173	B.
June	0	0	0	0	
July	0	0	0	0	
August	0	0	0	0	
September	0	0	0	0	

BOULDER CREEK AT CUYAMACA RESERVOIR, NEAR JULIAN,[1] CAL.

LOCATION.—At outlet of Cuyamaca reservoir, in Cuyamaca grant, 12 miles above mouth of Boulder Creek, and 7 miles south of Julian.

DRAINAGE AREA.—12.0 square miles; measured on topographic map.

RECORDS AVAILABLE.—June 19, 1912, to September 30, 1914.

GAGE.—Vertical staff on right side of short flume, 3½ feet above weir. Zero of gage is at practically same elevation as crest of 6-foot Cippoletti weir which is located 100 feet below outlet gates.

DISCHARGE MEASUREMENTS.—Made by wading 50 feet below weir.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 0.52 foot August 3 to 7 (discharge, 8.3 second-feet); channel dry November 6 to July 7 and August 1 and 2.

1912–1914: Maximum stage recorded, 0.58 foot July 20 to 24, 26 to 29, August 2 to 11, 24, and 25, 1912 (discharge, 12 second-feet); channel dry through long periods every year.

DIVERSIONS AND STORAGE.—The Cuyamaca dam, completed in 1886, was one of the first earth dams built in California for irrigation storage. The height, as originally constructed, was 35 feet. In 1894 the dam was enlarged, increasing the capacity of

[1] Published formerly as "near Lakeside."

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the reservoir to 11,400 acre-feet. The present dam is 635 feet long and 41½ feet high, having an inner slope of 2 to 1 and an outer slope of 1½ to 1. From the reservoir the water flows down the natural channel of Boulder Creek and San Diego River to the intake of San Diego flume, a distance of 12½ miles. The San Diego flume is more than 30 miles long, 6 feet wide, and 16 inches deep. It discharges into La Mesa reservoir about 8 miles northeast of San Diego. This system supplied the city of San Diego with water until 1906, when the Southern California Mountain Water Co. extended its system to the city. Water was furnished the city of San Diego during the spring flood of 1914. The flume now supplies water for irrigation and domestic service. Area irrigated is about 4,000 acres. Seven per cent of the flow is used for domestic service. Water from the South Fork of San Diego River is also diverted into this flume. The Capitan Grande Indian Reservation has a water right of 0.8 second-feet from the flume.

ACCURACY.—On account of the velocity of approach it is not practicable to use the weir formula. Rating curve well defined; results excellent.

COOPERATION.—Station maintained in cooperation with Cuyamaca Water Co., through W. S. Post, engineer.

Discharge measurements of Boulder Creek at Cuyamaca reservoir outlet, near Julian, Cal., during the year ending Sept. 30, 1914.

[Made by F. C. Ebert.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Aug. 21	0.40	5.5
Sept. 10	.22	2.2

Daily discharge, in second-feet, of Boulder Creek at Cuyamaca reservoir, near Julian, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	July.	Aug.	Sept.	Day.	Oct.	Nov.	July.	Aug.	Sept.
1	4.2	0.4	0.0	0.0	5.6	16	4.2	.....	7.8	5.6	2.3
2	1.6	.4	.0	.0	5.6	17	4.2	.....	7.8	5.6	2.3
3	1.6	.4	.0	8.3	5.6	18	4.2	.....	7.8	5.6	2.3
4	1.6	.4	.0	8.3	5.6	19	.6	.....	7.8	5.6	2.3
5	1.6	.3	.0	8.3	5.6	20	.6	.....	7.8	5.6	2.3
6	1.6	.....	.0	8.3	5.6	21	.6	.....	7.8	5.6	2.3
7	1.6	.....	.0	8.3	3.6	22	.6	.....	3.4	5.6	2.3
8	1.6	.....	1.0	5.6	3.6	23	.6	.....	3.4	3.6	2.3
9	1.6	.....	6.0	3.6	3.6	24	1.6	.....	3.4	3.6	2.3
10	4.2	.....	6.0	3.6	3.6	25	1.6	.....	3.4	3.6	2.3
11	4.2	.....	6.0	5.6	2.3	26	1.6	.....	3.4	3.6	2.3
12	2.2	.....	7.8	5.6	2.3	27	.6	.....	3.4	3.6	2.3
13	2.2	.....	7.8	5.6	2.3	28	.4	.....	3.4	3.6	2.3
14	2.2	.....	7.8	5.6	2.3	29	.4	.....	5.2	3.6	2.3
15	2.8	.....	7.8	5.6	2.3	30	.4	.....	5.2	5.6	2.3
						31	.4	.....	7.8	5.6	.....

NOTE.—Discharge determined from a well-defined rating curve. Channel dry Nov. 5 to July 7. Water was let out of reservoir at 8.15 p. m. July 8; gage height 0.42 foot, discharge 6.0 second-feet for 4/24 day, equals 1.0 second-foot for day.

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Monthly discharge of Boulder Creek at Cuyamaca reservoir, near Julian, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	4.2	4	1.85	114	A.
November	.4	.0	.06	4	B.
December	.0	.0	.0	0	
January	.0	.0	.0	0	
February	.0	.0	.0	0	
March	.0	.0	.0	0	
April	.0	.0	.0	0	
May	.0	.0	.0	0	
June	.0	.0	.0	0	
July	7.8	.0	4.48	275	A.
August	8.3	.0	5.09	313	A.
September	5.6	2.3	3.57	212	A.
The year	8.3	.0	1.27	918	

BOULDER CREEK AT MOUTH, NEAR LAKESIDE, CAL.

LOCATION.—In the NW. ¼ sec. 12, T. 14 S., R. 2 E., 300 feet above junction with San Diego River, about 14 miles northeast of Lakeside.

DRAINAGE AREA.—33.5 square miles (measured on topographic map).

RECORDS AVAILABLE.—August 12, 1912, to September 30, 1914.

GAGE.—Vertical staff on left bank in pool above weir. This gage was destroyed by flood in January, 1914. On March 1, 1914, a vertical staff was installed on right wing wall above weir.

DISCHARGE MEASUREMENTS.—Made from foot plank over flume or by wading.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year and for period 1912–1914, 3.60 feet January 27 (discharge computed from extension of rating curve, 83 second-feet); no flow July 2 to 8, 1914.

STORAGE.—When water is being stored at Cuyamaca reservoir, 12 miles above the station, the record shows only the run-off from the drainage area below the reservoir. A comparison of the flow at the outlet of the reservoir and at the mouth during the release of stored water will show approximately the loss by evaporation and seepage. Practically no run-off from intervening drainage area during summer season. See also Boulder Creek at Cuyamaca reservoir near Julian, Cal.

ACCURACY.—Rating curve fairly well defined; results good.

COOPERATION.—Station maintained in cooperation with Cuyamaca Water Co., through W. S. Post, engineer.

Discharge measurements of Boulder Creek at mouth, near Lakeside, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 20	F. C. Ebert	1.17	4.6	May 12	W. D. McFadden	1.20	5.4
28	do	2.50	45	13	F. C. Ebert	1.17	5.0
Apr. 20	do	1.03	2.5				

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Daily discharge, in second-feet, of Boulder Creek at mouth, near Lakeside, Cal., for the ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Se
1	3.2	1.4	2.0	2.7	12	3.6	14.5	2.6	1.0	8.0	
2	3.6	1.5	1.9	2.5	10.5	3.4	17	2.6	.0	1.8	
3	2.4	1.6	1.8	2.3	8.6	3.4	10.5	2.6	.0	1.8	
4	2.6	1.8	1.8	2.2	7.4	3.4	10.5	2.6	.0	4.6	
5	2.1	1.6	1.8	2.0	7.1	3.4	7.4	2.6	.0	5.6	
6	2.0	1.5	1.8	2.0	6.5	3.6	5.9	2.4	.0	5.6	
7	1.8	1.5	1.8	2.0	6.5	3.4	5.9	2.4	.0	5.6	
8	1.6	1.4	1.8	2.0	5.9	3.4	4.6	3.6	.0	4.2	
9	2.0	1.3	1.8	2.0	5.3	3.2	4.0	3.6	1.0	2.9	
10	3.4	1.1	1.8	2.0	4.8	3.2	4.0	3.0	2.0	2.5	
11	2.6	1.1	1.8	1.8	4.8	3.4	4.0	2.4	2.0	2.4	
12	2.3	1.1	1.8	1.8	4.4	3.4	3.8	2.4	2.8	2.3	
13	2.2	11.0	1.8	1.8	4.2	3.2	4.4	2.0	8.0	2.9	
14	2.3	2.3	1.8	1.8	4.2	2.9	4.4	1.9	4.2	2.9	
15	3 2	1.8	1.8	1.8	4.0	2.9	4.4	1.9	3.0	2.9	
16	3.4	1.8	1.7	2.5	4.0	2.9	4.2	1.8	6.5	3.0	
17	3.2	1.7	1.8	5.0	3.8	2.8	4.2	1.8	5.6	2.9	
18	3.0	1.6	1.8	4.0	3.4	2.7	3.8	1.8	6.2	2.3	
19	2.9	1.9	1.8	11.0	3.6	2.7	3.8	1.8	5.9	2.9	
20	2.0	3.0	1.8	5.0	3.2	2.6	3.8	1.8	5.9	2.9	
21	1.7	2.8	1.9	3.4	3.4	2.5	3.6	1.6	5.6	2.9	
22	1.5	2.2	2.0	3.0	3.0	4.6	3.2	1.6	2.8	3.0	
23	1.6	1.8	5.0	2.8	3.0	18	3.2	1.6	2.3	2.3	
24	1.7	1.8	3.4	3.0	3.4	9.5	3.2	1.5	2.3	2.5	
25	1.8	1.8	2.7	3.4	3.2	4.6	3.2	1.5	2.3	2.5	
26	1.8	1.8	3.2	5.6	3.4	4.2	3.2	1.4	2.3	1.6	
27	1.4	1.8	2.0	83	3.8	4.2	3.2	1.3	2.2	1.0	
28	1.3	1.8	2.5	29	3.8	3.8	3.0	1.3	2.2	1.0	
29	1.5	1.8	2.5	.....	3.4	4.8	3.0	1.2	2.3	1.1	
30	1.4	1.8	2.2	.....	4.0	19.5	2.8	1.1	2.8	1.9	
31	1.4	.....	2.5	.....	3.6	.....	2.8	.....	4.6	2.0	....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge interpolated Au
No record Jan. 29 to Feb. 28.

Monthly discharge of Boulder Creek at mouth near Lakeside, Cal., for the year end Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	A
	Maximum.	Minimum.	Mean.		
October	3.6	1.3	2.22	136	]
November	11.0	1.1	2.05	122	]
December	5.0	1.7	2.13	131	]
January 1-28	83	1.8	6.84	380	]
March	12.0	3.0	4.91	302	]
April	19.5	2.5	4.64	276	]
May	17.0	2.8	5.15	317	]
June	3.6	1.1	2.06	123	]
July	8.0	.0	2.77	170	]
August	8.0	1.0	2.96	182	]
September	2.7	1.4	2.01	120	]

SAN DIEGO FLUME AT DIVERTING DAM NEAR LAKESIDE, CAL.

LOCATION.—In the SE. ¼ sec. 11, T. 14 S., R. 2 E., at diverting dam about 13 m northeast of Lakeside.

GAGE.—Vertical staff fastened to flume about 500 feet below intake and a short tance above sand box. A Sanders & Rising water-stage recorder is installe same location.

RECORDS AVAILABLE.—May 4, 1913, to September 30, 1914.

DISCHARGE MEASUREMENTS.—Made from foot plank across flume at gage.

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URACY.—Rating curves fairly well defined; results good. November, 1914, the flume was lined with roofing paper to reduce leakage. Discharge measurements indicate that between April 20 and May 13, 1914, the flume settled about one-tenth of a foot.

PERATION.—Station maintained in cooperation with Cuyamaca Water Co. through W. S. Post, engineer.

harge measurements of San Diego flume at diverting dam near Lakeside, Cal., during the year ending Sept. 30, 1914.

e.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
20	Volcan Land & Water Co.	*Feet.* 0.43	*Sec.-ft.* [a] 5.0	Mar. 11	Volcan Land & Water Co.	*Feet.* 1.28	*Sec.-ft.* 24
20	do	.27	[a] 2.2	Apr. 7	do	.90	13.6
20	do	.70	[a] 11.7	20	F. C. Ebert	.57	6.0
20	do	1.15	[a] 25	May 13	do	.95	12.2
10	do	1.28	25				

[a] Water spilled back into river at sand gate below gage.

y discharge, in second-feet, of San Diego flume at diverting dam near Lakeside, Cal., for the year ending Sept. 30, 1914.

ay.	Oct.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	3.5	0.0	3.0	19	28	22	13	5.5	0.0	4.1	3.8
.....	2.5	.0	2.8	19	28	19	14	5.5	.0	3.2	3.8
.....	2.1	.0	2.3	19	28	16	20	5.5	.0	2.4	3.5
.....	2.3	.0	2.4	19	28	15	25	5.7	.0	3.2	3.5
.....	2.2	.0	2.4	15	28	14	24	5.7	.0	3.9	2.8
.....	2.4	.0	.0	16	28	15	13	5.1	.0	2.9	3.2
.....	2.5	.0	.0	16	26	17	14	3.9	.0	4.3	3.0
.....	2.3	.6	.0	8.7	25	17	11	11	.0	3 9	3.6
.....	1.4	.6	.0	11	24	14	12	9.6	5.0	3.5	3.3
.....	2.8	.0	.0	11	25	14	16	11	3.0	3.2	2.1
.....	2.7	.0	.0	11	24	14	14	6.4	2.0	2.4	1.5
.....	2.4	.0	.0	11	23	14	14	3.8	3.5	2.4	1.9
.....	2.0	.0	.0	13	23	14	12	6.2	4.6	3.2	1.9
.....	2.2	.6	.0	12	19	13	11	3.8	4.3	3.2	2.0
.....	2.7	.0	.0	11	18	12	11	4.7	4.4	3.0	2.3
.....	2.3	.0	.0	9.4	20	11	12	3.3	4.6	3.2	2.3
.....	2.4	.9	.0	7.8	18	11	11	.1	4.6	3.3	2.1
.....	2.4	.9	.0	11	16	11	13	.0	3.0	3.3	2.0
.....	2.4	.0	.0	6.6	16	6.0	9.1	.0	3.3	3.3	1.9
.....	2.2	.6	.7	9.8	16	6.4	8.3	.0	3.8	3.8	1.4
.....	2.6	.6	.0	3.5	15	7.2	7.4	.0	3.0	3.8	1.2
.....	1.6	2.4	1.2	19	15	12	7.8	.0	3.0	3.9	1.5
.....	1.3	6.2	.0	24	14	21	7.6	.0	2.9	3.8	1.8
.....	1.2	3.8	.0	28	15	27	7.8	.0	2.6	3.2	1.8
.....	.5	.0	.0	22	14	26	7.8	.0	2.8	3.2	1.8
.....	.2	1.6	.0	29	14	19	8.3	.0	2.6	3.6	1.6
.....	.0	3.9	.0	28	17	16	7.4	.0	2.8	3.5	1.6
.....	.0	3.0	8.3	28	17	15	7.6	.0	2.8	3.5	1.4
.....	.6	3.0	18	.....	22	16	7.0	.0	2.8	3.2	1.8
.....	.5	3.0	19	.....	24	15	6.6	.0	2.9	3.2	1.2
.....	.0	2.0	19	.....	24	.....	5.7	.....	3.3	3.6	.....

TE.—Discharge determined from three fairly well defined rating curves applicable as follows: Oct. 1–30; 8 to Apr. 30; May 1 to Sept. 30. Discharge Oct. 27, 28, 31, Dec. 6, 7, and July 8 to 10, estimated; flume robably dry November.

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Monthly discharge of San Diego flume at diverting dam near Lakeside, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	3.5	0.0	1.81	111	C.
November	.0	.0	.0	0	
December	6.2	.0	1.09	67	C.
January	19	.0	2.55	157	C.
February	29	3.5	15.6	866	A.
March	28	14	21.0	1,290	A.
April	27	6	15.0	893	B.
May	25	5.7	11.9	732	B.
June	11	.0	3.23	192	B.
July	4.6	.0	2.5	154	B.
August	4.3	2.4	3.36	207	B.
September	3.8	1.2	2.25	134	B.
The year	29	.0	6.64	4,800	

SAN DIEGO FLUME NEAR LAKESIDE, CAL.

LOCATION.—One-fourth mile above trestle crossing at Los Coches Creek, about 3 miles southeast of Lakeside.

RECORDS AVAILABLE.—January 1, 1907, to September 30, 1914.

GAGE.—A Sanders & Rising water-stage recorder installed November 12, 1912, at patrolman's cabin; on March 4, 1914, recorder was moved upstream about one-fourth mile.

DISCHARGE MEASUREMENTS.—Made from foot plank across flume at gage.

STORAGE AND DIVERSIONS.—The Cuyamaca reservoir, on the headwaters of Boulder Creek, has a capacity of 11,400 acre-feet. From the reservoir the water flows down the natural channel of Boulder Creek and San Diego River to the intake of the San Diego flume, a distance of 12½ miles. Water is diverted into flume from South Fork of San Diego River.

ACCURACY.—Rating curve fairly well defined. On account of the diversion for irrigation on the Capitan Grande Indian Reservation the record does not show the total diversion. When the flume was dry, October 31, 1913, to January 25, 1914, it was lined with roofing paper to reduce leakage; results good.

COOPERATION.—Station maintained in cooperation with the Cuyamaca Water Co., through W. S. Post, engineer.

Discharge measurements of San Diego flume near Lakeside, Cal., during the year ending Sept. 30, 1914.

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Oct. 3	0.14	0.4	Mar. 3	0.91	16	Apr. 19	[a] 0.74	11
Feb. 1	.23	1.7	24	[a] .95	16	May 12	[a] .76	12

[a] New gage.

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discharge, in second-feet, of San Diego flume near Lakeside, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	2.0	.....	1.6	15.1	16.0	16.3	6.2	.....	5.0	5.2
.....	1.8	.....	1.3	16.0	16.6	16.9	6.2	.....	4.8	5.4
.....	.4	.....	1.2	16.0	15.4	16.9	6.2	.....	3.8	5.2
.....	.7	.....	.9	15.7	15.7	16.6	5.8	.....	3.8	5.2
.....	.8	.....	3.0	16.3	16.3	16.3	5.6	.....	5.8	4.8
.....	.7	.....	7.7	16.0	16.6	15.4	5.6	.....	4.6	4.8
.....	.9	.....	10.0	15.7	16.3	14.0	5.6	.....	5.0	4.8
.....	.7	.....	10.5	15.7	16.6	11.8	5.8	.....	5.8	4.8
.....	.2	.....	11.5	15.7	15.4	12.3	7.5	.....	5.0	4.8
.....	.2	.....	11.5	15.7	15.7	15.7	8.1	4.8	4.0	3.3
.....	1.4	.....	12.3	16.0	15.7	14.2	6.8	2.4	4.4	3.8
.....	.7	.....	12.6	16.0	15.7	12.6	3.5	3.5	3.3	4.0
.....	.4	.....	12.1	16.0	15.1	13.4	5.0	6.0	3.8	3.5
.....	.5	.....	12.3	16.6	14.0	12.3	5.0	6.0	4.4	3.3
.....	.7	.....	12.6	17.2	13.4	12.1	4.2	3.7	5.0	3.5
.....	1.0	.....	10.3	16.9	12.9	11.5	4.2	6.8	5.0	3.8
.....	1.0	.....	11.5	16.6	12.4	11.8	2.8	6.2	5.0	3.8
.....	1.4	.....	11.5	16.6	11.8	12.1	.8	5.2	5.0	3.7
.....	1.0	.....	10.5	16.9	10.8	11.3	.5	5.2	3.7	3.5
.....	.9	.....	6.0	16.9	6.6	9.0	.....	5.4	4.4	3.5
.....	1.6	.....	13.7	17.5	8.6	9.0	.....	5.2	5.0	3.2
.....	.5	.....	3.3	17.2	12.9	8.4	.....	5.0	5.0	3.2
.....	.....	.....	10.5	17.2	14.0	8.8	.....	6.0	5.0	3.3
.....	.....	.....	13.7	17.5	17.2	8.4	.....	4.8	4.0	3.5
.....	.....	.....	13.2	17.8	18.4	8.4	.....	5.0	4.2	3.5
.....	.....	0.1	15.4	17.5	17.2	8.8	.....	4.8	4.6	3.3
.....	.....	.3	14.8	17.2	18.7	8.6	.....	4.8	4.8	3.2
.....	.....	.5	15.1	18.1	17.8	8.4	.....	4.6	4.8	2.8
.....	.....	1.0	.....	18.1	18.1	7.7	.....	5.0	5.0	2.8
.....	.....	.2	4.0	.....	15.4	15.7	7.0	.....	5.0	3.8	3.0
.....	.....	2.1	.....	14.6	.....	.....	6.6	.....	5.0	4.4	.....

E.—Discharge determined from 2 fairly well defined rating curves applicable Oct. 1–31 and Jan. 26 to 30. Flume dry Oct. 31, 1913, to Jan. 25, 1914, and for repairs from June 20 to July 9, 1914. Recorder orking, discharge interpolated, Apr. 17, May 1 and 11.

hly discharge of San Diego flume near Lakeside, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
er	2.0	0.0	0.64	39	
nber	.0	.0	.0	0	
ber	.0	.0	.0	0	
ry	4.0	.0	.26	16	
ary	15.4	.9	9.66	536	B.
	18.1	14.6	16.5	1,010	B.
	18.7	6.6	14.9	887	B.
	16.9	6.6	11.7	719	B.
	8.1	.0	3.18	189	B.
	6.8	.0	3.56	219	B.
t	5.8	3.3	4.59	282	B
nber	5.4	2.8	3.88	231	B.
The year	18.7	.0	5.71	4,130	

SOUTH FORK OF SAN DIEGO RIVER NEAR ALPINE, CAL.

TION.—In the NE. ¼ sec. 10, T. 15 S., R. 2 E., in Capitan Grande Indian Reservation, about half a mile above junction with San Diego River and 4 miles north of Alpine.

NAGE AREA.—44.5 square miles (measured on topographic map).

RDS AVAILABLE.—January 1, 1913, to September 30, 1914.

.—Sanders & Rising water-stage recorder on left bank about 100 feet below intake of South Fork flume. Vertical staff is fastened to outside of gage well.

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DISCHARGE MEASUREMENTS.—Made from bridge 1,500 feet below gage or by wading.
CHANNEL AND CONTROL.—Solid rock and gravel; rough.
EXTREMES OF DISCHARGE.—Maximum stage recorded during year and for period 1913–14, 4.75 feet February 21 (discharge, 217 second-feet); minimum stage, dry four-fifths of the year.
DIVERSIONS.—South Fork flume, which heads above the station, diverts water into San Diego flume. (See p. 39.)
ACCURACY.—Rating curve fairly well defined; recording gage not in operation February 22–27, 1914; discharge for this period estimated by comparison with record on San Diego River near Lakeside and from precipitation records. Otherwise results are good.
COOPERATION.—Maintained in cooperation with Cuyamaca Water Co., through W. S. Post, engineer.

Discharge measurements of South Fork of San Diego River near Alpine, Cal., during the year ending Sept. 30, 1914.

[Made by F. C. Ebert.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Jan. 27	3.80	129
28	2.10	25

Daily discharge, in second-feet, of South Fork of San Diego River near Alpine, Cal., for the year ending Sept. 30, 1914.

Day.	Jan.	Feb.	Apr.	May.	June.	Day.	Jan.	Feb.	Apr.	May.	June.
1				26		16	0.3				
2				14		17	.3				
3				5.2		18	.3				
4				6.0		19	.1	42			
5				1.3		20		98			
6			0.7	1.3	0.05	21	.05	217			
7			1.0	.6	.05	22	.1	130	0.7		
8			.7	.5		23	.05	60	8.5		
9			.7			24	.05	20	16		
10	0.05		.5			25		15	2.0		
11	.05		.4			26	14	10	3.0		
12			.3	.05		27	54	5	3.0		
13			.05			28	39	2.5	.7		
14						29	6.8		2.0		
15	.05					30	.6		16		
						31	4.5				

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge Jan. 19 and 20 estimated. See also remarks under accuracy in station description. Channel dry on all days for which discharge is not given.

Monthly discharge of South Fork of San Diego River near Alpine, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0.0	0.0	0.0	0	
November	.0	.0	.0	0	
December	.0	.0	.0	0	
January	54	.0	3.88	239	C.
February	217	.0	21.4	1,190	D.
March	.0	.0	.0	0	
April	16	.0	1.88	112	C.
May	26	.0	1.77	109	C.
June	.05	.0	[a].0	0	
July	.0	.0	.0	0	
August	.0	.0	.0	0	
September	.0	.0	.0	0	
The year	217	.0		1,650	

[a] Practically no flow.

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SOUTH FORK FLUME NEAR ALPINE, CAL.

LOCATION.—In the NE. ¼ sec. 10, T. 15 S., R. 2 E., in Capitan Grande Indian Reservation, 100 feet below diversion dam, about half a mile above mouth of South Fork of San Diego River, and 4 miles north of Alpine.

RECORDS AVAILABLE.—January 10, 1913, to September 30, 1914.

GAGE.—Sanders & Rising water-stage recorder on left side of flume 100 feet below intake; vertical staff is fastened to flume at same location.

DISCHARGE MEASUREMENTS.—Made from foot plank across flume at gage.

ACCURACY.—Quantities measured are small; results only fair.

COOPERATION.—Station maintained in cooperation with Cuyamaca Water Co., through W. S. Post, engineer.

Discharge measurements of South Fork flume near Alpine, Cal., during the year ending Sept. 30, 1914.

[Made by F. C. Ebert.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
an. 27	0.60	7.9
28	.40	2.8

Daily discharge, in second-feet, of South Fork flume near Alpine, Cal., for the year ending Sept. 30, 1914.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	0.0	0.00	0.01	1.6	4.4	1.0	0.8	0.15
2	.0	.00	.01	1.3	4.0	1.0	.6	.08
3	.0	.00	.01	1.1	3.9	1.0	.8	.08
4	.0	.00	.01	1.0	3.9	1.0	.8	.06
5	.0	.00	.01	1.0	3.9	1.0	.6	.06
6	.0	.01	.01	1.0	3.9	1.0	.6	.06
7	.0	.01	.01	.8	3.9	1.0	.6	.15
8	.0	.01	.01	.6	3.3	1.0	.6	.2
9	.0	.01	.01	.6	2.7	1.0	1.0	.2
10	.0	.01	.06	.6	2.1	1.0	1.0	.15
11	.0	.01	.06	.6	2.1	1.0	1.0	.08
12	.0	.01	.06	.4	2.1	1.0	.9	.04
13	3.7	.01	.04	.2	2.0	1.0	.9	.03
14	.2	.01	.03	.08	1.8	1.0	1.2	.00
15	.2	.01	.02	.08	1.8	1.0	1.5	.00
16	.2	.01	.01	.08	1.8	.9	1.5	.00
17	.2	.01	.00	.08	1.8	.9	1.4	.00
18	.0	.01	.02	.08	1.8	.6	1.0	.00
19	.0	.01	.04	.1	1.8	.5	.8	.00
20	.0	.01	.00	.15	1.8	.4	.5	.00
21	.0	.01	.00	2.1	1.4	.4	.4	.00
22	.0	.01	.00	5.1	1.0	.4	.4	.00
23	.0	.01	.00	5.1	1.0	.4	.2	.00
24	.0	.01	.5	3.4	.9	.6	.3	.00
25	.0	.01	.08	.4	.9	1.0	.5	.00
26	.0	.01	10.5	.6	.03	1.2	.5	.00
27	.0	.01	26	3.0	.03	1.0	.5	.00
28	.0	.01	3.7	3.7	.00	.8	.5	.00
29	.0	.01	9.2	.....	1.0	.5	.5	.00
30	.0	.01	4.6	.....	1.0	.4	.2	.00
31	.....	.01	3.7	.....	1.0	.....	.2	.....

NOTE.—Discharge determined from a fairly well defined rating curve. Flume dry during October, 1913, July, August, and September, 1914. Discharge Dec. 6, 1913, to Jan. 9, 1914, reported as constant; discharge Dec. 14 to Jan. 9, Mar. 8, 9, and 21, estimated by engineers of the U. S. Geological Survey; discharge Feb. 1–6 estimated by W. S. Post.

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Monthly discharge of South Fork flume near Alpine, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0.0	0.0	0.0	0	
November	3.7	.0	.15	9	
December	.01	.0	.008	.5	
January	26	.0	1.89	116	D.
February	5.1	.08	1.24	69	D.
March	4.4	.0	2.03	125	C.
April	1.2	.4	.83	49	
May	1.5	.2	.72	44	
June	.2	.0	.045	2.7	
July	.0	.0	.0	0	
August	.0	.0	.0	0	
September	.0	.0	.0	0	
The year	26	.0	.575	415	

SAN DIEGUITO RIVER BASIN.

SANTA YSABEL CREEK NEAR SANTA YSABEL, CAL.

LOCATION.—At bridge on Santa Ysabel and Warner Springs road, in Santa Ysabel grant, about 1½ miles north of Santa Ysabel.

DRAINAGE AREA.—12.8 square miles (measured on topographic map).

RECORDS AVAILABLE.—August 29, 1913, to September 30, 1914.

GAGE.—Vertical staff fastened to left abutment of bridge. Observer, C. R. Green.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Bedrock and boulders. A concrete control was built across channel just below gage October 5, 1913.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year and for period 1913–14, 2.00 feet at 3.30 p. m. January 27 (discharge, 84 second-feet); channel dry parts of October and all of July to September, 1913–14.

ACCURACY.—Rating curve fairly well defined except for high stage; results only fair, owing to small quantities of water measured.

COOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

Discharge measurements of Santa Ysabel Creek near Santa Ysabel, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 5	F. C. Ebert	0.5	0.5	Mar. 14	W. J. Isbell	0.96	6.1
8	W. J. Isbell	0.72	.4	17	do	.94	5.8
15	do	.69	.3	Apr. 3	do	.93	5.8
Nov. 4	do	.73	.7	17	do	.88	4.1
15	do	.75	.7	24	F. C. Ebert	.95	7.2
22	do	.78	1.1	May 7	W. J. Isbell	.94	5.7
Dec. 18	do	.78	1.1	11	do	.93	5.0
Jan. 6	do	.81	1.4	18	do	.91	4.4
23	F. C. Ebert	.88	4.2	June 2	do	.85	3.1
Feb. 8	W. J. Isbell	.93	5.3	16	do	.83	1.8
Mar. 5	do	1.02	9.3	Aug. 21	F. C. Ebert	.57	Dry.

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Daily discharge, in second-feet, of Santa Ysabel Creek near Santa Ysabel Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	0.0	0.2	1.5	2.9	11	17	8.3	8.3	2.9
2	.0	.5	1.5	1.5	8.3	16	8.3	6.3	2.9
3	.0	.8	1.5	1.5	6.3	13	6.3	6.3	2.9
4	.0	.2	1.5	1.5	6.3	11	6.3	6.3	2.9
5	.0	.8	1.5	1.5	6.3	11	6.3	6.3	2.9
6	.0	.2	1.5	1.5	6.3	11	6.3	6.3	2.9
7	.0	.2	1.5	1.5	4.3	11	6.3	6.3	4.6
8	.2	.2	1.5	1.5	6.3	9	6.3	6.3	6.3
9	.2	.2	.8	1.5	4.3	8.3	6.3	6.3	4.3
10	.2	.2	.8	1.5	4.3	8.3	6.3	6.3	4.3
11	.2	.2	.8	1.5	4.3	8.3	6.3	6.3	4.3
12	.2	.8	1.5	1.5	4.3	6.3	6.3	6.3	4.3
13	.2	2.9	.8	1.5	4.3	6.3	6.3	6.3	2.9
14	.2	1.5	1.2	1.5	4.3	6.3	6.3	6.3	2.9
15	.2	.8	1.5	4.3	4.3	5.3	6.3	6.3	2.9
16	.2	.8	1.5	4.3	4.3	4.3	4.3	6.3	2.9
17	.2	.8	1.5	4.3	4.3	4.3	6.3	5.3	2.9
18	.0	.8	1.5	5.3	4.3	6.3	4.3	4.3	2.9
19	.0	2.9	1.5	6.3	19	6.3	4.3	4.3	2.9
20	.0	2.9	1.5	4.3	80	6.3	6.3	4.3	2.9
21	.0	1.5	1.5	2.9	80	6.3	6.3	4.3	2.9
22	.2	1.5	1.5	2.9	50	6.3	6.3	4.3	2.9
23	.0	1.5	4.3	2.9	36	6.3	8.3	4.3	2.9
24	.2	1.5	2.9	4.3	25	6.3	6.3	4.3	2.9
25	.0	1.5	1.5	10	22	6.3	6.3	4.3	1.5
26	.0	1.5	2.9	25	19	6.3	6.3	4.3	1.5
27	.0	1.5	2.9	84	19	6.3	6.3	4.3	1.5
28	.2	1.5	2.2	32	19	6.3	6.3	4.3	1.5
29	.2	1.5	1.5	22	.....	8	6.3	4.3	1.5
30	.2	1.5	4.3	19	.....	11	8.3	2.9	1.5
31	.2	.....	2.9	13	.....	8.3	.....	2.9	.....

NOTE.—Discharge determined from a rating curve fairly well defined below 20 second-feet; no flow during July, August, and September.

Monthly discharge of Santa Ysabel Creek near Santa Ysabel, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0.2	0.0	0.10	6	
November	2.9	.2	1.10	66	
December	4.3	.8	1.78	109	
January	84	1.5	8.68	534	C.
February	80	4.3	16.7	928	C.
March	17	4.3	8.17	502	C.
April	8.3	4.3	6.37	379	C.
May	8.3	2.9	5.34	328	C.
June	6.3	1.5	2.98	177	
July	.0	.0	.0	0	
August	.0	.0	.0	0	
September	.0	.0	.0	0	
The year	84	.0	4.18	3,030	

SANTA YSABEL CREEK NEAR MESA GRANDE, CAL.

LOCATION.—In the NW. ¼ sec. 21, T. 12 S., R. 2 E., at dam site, about 1 mile below Sutherland and 4½ miles southwest of Mesa Grande.

DRAINAGE AREA.—53.4 square miles (measured on topographic map).

RECORDS AVAILABLE.—December 29, 1912, to September 30, 1914.

GAGE.—Friez water-stage recorder on right bank; a vertical staff is fastened to the outside of gage well.

DISCHARGE MEASUREMENTS.—Made from cable at gage or by wading.

CHANNEL AND CONTROL.—Shifting sand. A concrete control was installed at an outcropping of bedrock 20 feet below gage.

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EXTREMES OF DISCHARGE.—Maximum stage recorded during year and for period 1913–14, 4.20 feet about 6 a. m. February 21 (discharge, computed from extension of rating curve, 908 second-feet); no flow October 1 and 2, August 12 to 29, and September 6 to 13, 1914, and during several periods in 1913.

ACCURACY.—Sand occasionally collects at the artificial control and causes channel to shift slightly. Discharge measurements are made frequently and results are good.

COOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

Discharge measurements of Santa Ysabel Creek near Mesa Grande, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 1	R. W. Day	.....	Dry	Feb. 4	R. W. Day	0.82	22
8	.....do	0.19	0.3	11	.....do	.72	15
15	.....do	.18	.2	18	.....do	.79	15
25	.....do	.13	.1	19	.....do	1.44	105
29	.....do	.18	.3	20	.....do	1.21	79
Nov. 5	.....do	.27	.8	21	.....do	2.95	481
12	.....do	.28	.9	22	.....do	2.36	243
18	.....do	.35	1.7	26	.....do	1.45	66
26	.....do	.40	2.2	Mar. 5	F. C. Ebert	.93	40
Dec. 3	.....do	.41	2.2	11	R. W. Day	.83	24
10	.....do	.37	1.8	18	.....do	.76	19
17	.....do	.40	2.2	25	.....do	.75	16
24	.....do	.53	4.5	Apr. 1	.....do	.77	19
31	.....do	.56	5.1	8	.....do	.73	15
Jan. 3	.....do	.48	3.8	15	.....do	.67	12
7	.....do	.45	2.7	23	F. C. Ebert	.78	22
14	.....do	.43	2.9	29	R. W. Day	.79	19
21	.....do	.57	5.9	May 6	.....do	.71	13
22	F. C. Ebert	.55	5.0	13	.....do	.65	11
28	R. W. Day	1.41	88				

Daily discharge, in second-feet, of Santa Ysabel Creek near Mesa Grande, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.0	0.4	2.4	5.0	29	32	17	20	7.0	1.0	0.1	0.4
2	.0	.7	2.4	5.0	25	31	17	20	7.0	1.0	.1	.4
3	.05	.9	2.4	4.4	24	34	16	18	7.4	1.1	.1	.4
4	.05	.9	2.4	4.1	22	36	16	17	7.0	1.1	.1	.2
5	.05	.9	2.4	3.9	22	37	20	15	7.4	1.0	.1	.1
6	.1	.9	2.4	3.6	20	33	18	14	7.4	.9	.1	.0
7	.2	.9	2.2	3.0	19	31	17	12	11	1.2	.1	.0
8	.3	.9	2.2	2.9	18	27	15	12	14	1.3	.1	.0
9	.4	.9	2.1	2.9	17	25	15	12	6.7	1.2	.1	.0
10	.4	1.0	1.9	2.9	16	23	15	12	6.0	1.0	.1	.0
11	.4	1.0	1.9	2.9	15	24	17	12	5.7	1.0	.2	.0
12	.3	1.0	1.9	2.9	13	24	15	11	5.0	1.1	.0	.0
13	.3	1.3	2.0	2.9	12	22	15	11	4.8	1.2	.0	.0
14	.3	1.3	2.1	2.7	12	22	14	11	4.8	1.4	.0	.3
15	.3	1.3	2.1	3.6	11	21	12	11	4.6	1.4	.0	.3
16	.3	1.4	2.2	9.1	10	20	12	11	4.6	1.2	.0	.3
17	.3	1.5	2.2	9.6	10	19	11	11	4.4	.9	.0	.2
18	.3	1.7	2.2	9.1	9	19	10	10	4.2	.7	.0	.1
19	.3	1.5	2.2	14	205	19	8.5	10	4.2	.6	.0	.1
20	.2	4.4	3.0	8.6	264	18	7	9.4	4.2	.5	.0	.1
21	.2	4.8	3.9	5.5	593	17	10	8.9	4.2	.6	.0	.1
22	.2	4.4	5.0	5.0	178	17	32	8.9	4.0	.2	.0	.2
23	.2	3.2	9.1	5.7	75	16	30	8.4	3.8	.2	.0	.2
24	.3	2.5	4.6	5.0	50	16	18	8.4	3.8	.2	.0	.2
25	.3	2.2	4.6	13	32	16	16	8.4	3.6	.2	.0	.1
26	.3	2.2	6.2	270	28	17	15	8.4	3.6	.1	.0	.2
27	.2	2.2	5.5	800	28	18	16	8.4	3.0	.1	.0	.6
28	.2	2.2	5.3	154	31	18	15	8.1	2.4	.1	.0	.6
29	.3	2.2	5.0	122	.....	19	21	7.7	1.5	.1	.0	.4
30	.3	2.2	5.3	40	.....	35	24	7.7	1.0	.1	.2	.2
31	.4	.....	5.3	33	.....	25	.....	7.0	.....	.1	.2	.....

NOTE.—Discharge determined from several fairly well defined rating curves and by indirect method for shifting channels. Discharge Oct. 2–7, 9–14, and 21 interpolated.

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onthly discharge of Santa Ysabel Creek near Mesa Grande, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0.4	0.0	0.24	15	
November	4.8	.4	1.76	105	C.
December	9.1	1.9	3.37	207	B.
January	800	2.7	50.2	3,090	B.
February	593	9	63.9	3,550	B.
March	37	16	23.6	1,450	B.
April	32	7	16.2	964	B.
May	20	7	11.3	695	B.
June	14	1.0	5.28	314	C.
July	1.4	.1	.74	46	
August	.2	.0	.05	3	
September	.6	.0	.19	11	
The year	800	.0	14.4	10,400	

SANTA YSABEL CREEK NEAR RAMONA, CAL.

LOCATION.—In the NE. ¼ sec. 27, T. 12 S., R. 1 E., at Pamo, 1 mile below mouth of Temescal Creek, 4 miles north of Ramona, and about 5 miles above the site of the station maintained at mouth of canyon near Escondido from 1906 to 1910.

DRAINAGE AREA.—110 square miles (measured on topographic map).

RECORDS AVAILABLE.—February 5, 1912, to September 30, 1914.

GAGE.—Staff in four sections on left bank with a short vertical section at control for extreme low water. Observer, C. M. De Venelle.

DISCHARGE MEASUREMENTS.—Made from cable at gage or by wading.

CHANNEL AND CONTROL.—Sand; somewhat shifting. On November 19, 1912, a concrete control was built about 30 feet below gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.95 feet, at 12 m. February 21 (discharge, computed from extension of rating curve, 1,960 second-feet); minimum stage recorded, 0.67 foot during parts of October and August (discharge, 0.1 second-foot).

1912–1914: Maximum stage recorded, 5.95 feet, at 12 m., February 21, 1914 (discharge, computed from extension of rating curve, 1,960 second-feet); minimum stage recorded, −0.15 foot September 18 to 20, 22 to 24, and 27 to 29 (discharge, 0.02 second-foot).

DIVERSIONS.—Water is diverted from Santa Ysabel Creek near mouth of canyon, 5 miles below the station, by East San Pasqual ditch, which takes out on the left bank, and West San Pasqual ditch, which takes out on the right bank and below the intake of the East San Pasqual ditch.

ACCURACY.—Gage read three times daily, except during high stages, when additional readings are taken; discharge measurements are made frequently and results are good.

COOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

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Discharge measurements of Santa Ysabel Creek near Ramona, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 4	F. C. Ebert	0.67	[a] 0.1	Jan. 26	R. W. Day	4.90	1,310
Nov. 12	R. W. Day	.79	.2	29	do	1.90	99
13	do	1.47	25	Feb. 6	do	1.50	26
14	do	1.15	5.7	10	do	1.43	30
16	do	1.00	1.7	22	do	3.05	388
20	do	1.21	7.2	Mar. 4	F. C. Ebert	1.72	69
21	do	1.18	6.3	11	R. W. Day	1.57	36
30	do	1.00	2.8	20	do	1.47	27
Dec. 4	do	.99	2.5	28	do	1.73	61
16	do	.99	2.4	Apr. 9	do	1.46	26
16	do	.99	2.4	23	F. C. Ebert	1.52	33
Jan. 8	do	1.10	3.5	May 1	R. W. Day	1.52	32
16	do	1.25	9.5	9	do	1.39	18
20	do	1.32	12	12	F. C. Ebert	1.38	17
22	F. C. Ebert	1.18	8.0				

[a] Estimated.

Daily discharge, in second-feet, of Santa Ysabel Creek near Ramona, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.1	0.1	3	6	44	77	35	32	12	1.5	0.1	0.1
2	.1	.1	2.5	5	38	67	33	29	12	1.0	.1	.1
3	.1	.1	2.5	5	33	60	32	27	11	.8	.1	.1
4	.1	.1	2.5	5	29	57	29	26	11	.7	.1	.1
5	.1	.2	2.5	5	28	57	33	24	10	.9	.1	.1
6	.1	.2	2.5	4	27	54	35	24	10	.4	.1	.1
7	.1	.2	2	4	26	44	30	21	13	.3	.1	.1
8	.1	.2	2	4	24	41	29	20	22	.8	.1	.1
9	.1	.2	1.5	4.5	24	41	28	18	14	.7	.1	.1
10	.1	.2	1.5	4	19	41	30	20	12	.2	.1	.1
11	.1	.2	1.5	4	22	37	26	19	11	.2	.1	.1
12	.1	.2	2	4	21	34	24	18	9.5	.2	.1	.1
13	.1	28	2	4	21	34	23	17	8.0	.2	.1	.1
14	.1	6	2	4	23	31	22	19	9.0	.2	.1	.1
15	.1	3	2.5	5	24	33	22	19	6.5	.2	.1	.1
16	.1	2.5	2.5	11	24	31	20	18	8.0	.2	.1	.1
17	.1	2.5	2.5	10	24	28	20	18	8.5	.1	.1	.1
18	.1	3	2.5	9	19	26	17	16	8.0	.1	.1	.1
19	.1	13	3	26	685	26	16	14	8.5	.1	.1	.1
20	.1	9	4	15	255	25	14	14	7.5	.1	.1	.1
21	.1	6.5	4	11	1,490	26	15	13	7.5	.1	.1	.1
22	.1	6	18	7	440	26	64	13	6.5	.1	.1	.1
23	.1	3	18	8	285	25	46	13	6.5	.1	.1	.1
24	.1	2.5	11	13	210	26	27	14	6.0	.1	.1	.1
25	.1	2.5	9	26	155	28	25	13	6.0	.1	.1	.1
26	.1	2.5	7	785	122	31	25	13	5.0	.1	.1	.1
27	.1	2	6	1,140	88	38	24	14	4.5	.1	.1	.1
28	.1	2	5	208	81	40	21	13	4.5	.1	.1	.1
29	.1	2	4.5	101	.....	38	23	12	3.0	.1	.1	.1
30	.1	2.5	5	66	.....	94	27	12	2.0	.1	.1	.1
31	.1	.....	6.5	51	.....	38	.....	11	.....	.1	.1	.....

NOTE.—Discharge determined as follows: Oct. 1 to Nov. 12 estimated from measurements; April, by indirect method for shifting channels; for rest of year from two fairly well defined rating curves.

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Monthly discharge of Santa Ysabel Creek near Ramona, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0.1	0.1	0.10	6	
November	28	.1	3.33	198	C.
December	18	1.5	4.53	279	B.
January	1,140	4	82.4	5,070	B.
February	1,490	19	153	8,500	B.
March	94	25	40.5	2,490	B.
April	64	14	27.2	1,620	B.
May	32	11	17.9	1,100	B.
June	22	2.0	8.77	522	B.
July	1.5	.1	.32	20	
August	.1	.1	.10	6	
September	.1	.1	.10	6	
The year	1,490	.1	27.3	19,800	

SAN DIEGUITO RIVER AT BERNARDO, CAL.

LOCATION.—At highway bridge at Bernardo, in San Bernardo grant, 5 miles below junction of Santa Ysabel and Santa Maria creeks, and 16 miles above mouth of river.

DRAINAGE AREA.—266 square miles (measured on topographic map).

RECORDS AVAILABLE.—April 17, 1912, to September 30, 1914.

GAGE.—Standard chain gage fastened to upstream side of bridge.

DISCHARGE MEASUREMENTS.—Made from cable 30 feet above gage or by wading.

CHANNEL AND CONTROL. Sand and shifting

EXTREMES OF DISCHARGE.—Maximum stage recorded during year and for period 1912–1914, 16.7 feet at 3 p. m. February 21 (discharge, computed from extension of rating curve, 3,200 second-feet); channel practically dry more than half of every year.

DIVERSIONS.—East and West San Pasqual ditches divert water for irrigation from the Santa Ysabel at the upper end of San Pasqual Valley. (See Santa Ysabel Creek near Ramona.) Water for irrigation is also pumped from wells along the river.

ACCURACY.—Discharge computed from two fairly well defined rating curves covering short periods and by indirect method for shifting channels; results fair.

COOPERATION.—Maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

Discharge measurements of San Dieguito River at Bernardo, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 18	F. C. Ebert	9.31	a 0.10	Mar. 23	F. C. Ebert	10.38	23
30	R. W. Day	10.24	59	Apr. 3	R. W. Day	10.58	34
31	F. C. Ebert	10.15	38	17	....do	10.28	3.3
Feb. 3	....do	9.99	19	18	F. C. Ebert	10.19	a 0.4
16	C. E. Hickok-J. Shell	9.70	2.9	24	R. W. Day	10.62	23
21	C. E. Hickok	15.62	2,430	May 8	....do	10.53	13
Mar. 2	F. C. Ebert	10.68	84	11	F. C. Ebert	10.27	0.8
6	R. W. Day	10.60	55				

a Estimated.

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Daily discharge, in second-feet, of San Dieguito River at Bernardo, Cal., for the year ing Sept. 30, 1914.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Ju
1	.....	0.1	33	108	61	52	
2	.....	.1	45	88	37	52	
3	.....	.1	23	93	29	42	
4	.....	.1	19	80	23	35	
5	.....	.1	15	67	23	35	
6	.....	.1	23	55	29	21	
7	.....	.1	23	47	23	21	
8	.....	.1	23	39	23	11	
9	.....	.1	19	16	17	7	
10	.....	.1	15	20	12	3	
11	.....	.1	12	20	12	2	
12	.....	.1	8	20	12	1	
13	.....	.1	3	20	12	1	
14	.....	.1	3	16	12	1	
15	.....	.1.	3	16	5	1	
16	.....	.1	3	16	5	1	
17	.....	.1	6	8	5	16	
18	.....	.1	8	8	2	7	
19	.....	.1	555	8	2	11	
20	0.1	.1	820	8	3	3	
21	.1	.1	2,870	8	2	3	
22	.1	.1	705	12	14	3	
23	.1	.1	399	16	72	3	
24	.1	.1	211	19	27	2	
25	.1	.1	157	18	21	2	
26	.1	52	157	22	7	3	
27	.1	1,680	132	21	3	3	
28	.1	285	108	44	11	2	
29	.1	110	.....	48	52	2	
30	.1	52	.....	155	52	2	
31	.1	33	.....	95	.....	2	...

NOTE.—Discharge determined by the indirect method for shifting channels and from rating curves ering short periods. Channel practically dry Oct. 1 to Dec. 19 and June 29 to Sept. 30.

Monthly discharge of San Dieguito River at Bernardo, Cal., for the year ending Sept. 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	A r
	Maximum.	Minimum.	Mean.		
October	0.0	0.0	0.0	0	
November	.0	.0	.0	0	
December	.1	.0	.04	2	
January	1,680	.1	71.4	4,390	
February	2,870	3	229	12,700	
March	155	8	39.1	2,400	
April	72	2	20.3	1,210	
May	52	1	11.3	695	
June	3	.0	.40	24	
July	.0	.0	.0	0	
August	.0	.0	.0	0	
September	.0	.0	.0	0	
The year	2,870	.0	29.6	21,400	

SAN DIEGUITO RIVER NEAR DEL MAR, CAL.

LOCATION.—In San Dieguito grant at Santa Fe ranch pumping plant, about 4 m above mouth, and 4½ miles northeast of Del Mar.

DRAINAGE AREA.—328 square miles (measured on topographic map).

RECORDS AVAILABLE.—January 22, 1913, to September 30, 1914, when station discontinued.

GAGE.—Vertical staff on right bank about 300 feet from pump house.

DISCHARGE MEASUREMENTS.—Made from bridge 2 miles below gage or by wad *near gage.*

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CHANNEL AND CONTROL.—Shifting sand.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year and for period 1913–14, 6.0 feet at 5 p. m. February 21 (discharge not determined); channel dry over two-thirds of year.

DIVERSIONS.—See San Dieguito River at Bernardo. Santa Fe ditch, having a capacity of about 10 second-feet, diverts 300 feet above gage. Record at this station shows amount of water wasted into Pacific Ocean.

ACCURACY.—Discharge computed from fairly well defined rating curves covering short periods and by indirect method for shifting channels; results fair. No estimates for high water have been made as the range of stage was not covered by discharge measurements.

COOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

Discharge measurements of San Dieguito River near Del Mar, Cal., during the year ending Sept., 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 30	W. S. Post	2.42	78	Mar. 8	F. C. Ebert	2.61	45
Feb. 8	do	2.00	22	27	do	2.45	17

Daily gage height, in feet, of San Dieguito River near Del Mar, Cal., for the year ending Sept. 30, 1914.

[W. E. Maguire, observer.]

Day.	Jan.	Feb.	Mar.	Apr.	May.	Day.	Jan.	Feb.	Mar.	Apr.	May
1	.....	2.2	2.9	2.65	2.65	16	.....	1.5	2.4	2.1	.....
2	.....	2.2	2.9	2.6	2.65	17	.....	1.5	2.4	.....	.....
3	.....	2.1	2.8	2.55	2.65	18	.....	1.75	2.4	.....	2.35
4	.....	2.1	2.8	2.55	2.5	19	.....	2.95	2.3	.....	2.2
5	.....	2.0	2.7	2.5	2.5	20	.....	4.5	2.35	.....	2.1
6	.....	1.95	2.7	2.5	2.5	21	.....	5.5	2.25	.....	1.95
7	.....	1.9	2.7	2.5	2.4	22	.....	4.65	2.3	.....	.....
8	.....	2.0	2.6	2.5	2.4	23	.....	3.7	2.3	2.7	.....
9	.....	2.1	2.5	2.45	2.3	24	.....	3.35	2.4	2.6	.....
10	.....	2.0	2.5	2.4	2.15	25	.....	3.2	2.45	2.5	.....
11	.....	1.9	2.5	2.4	2.05	26	.....	3.05	2.45	2.4	.....
12	.....	1.95	2.5	2.35	2.0	27	4.4	3.0	2.45	2.4	.....
13	.....	1.9	2.45	2.4	.....	28	3.6	2.95	2.6	2.4	.....
14	.....	1.8	2.45	2.3	.....	29	2.7	.....	2.75	2.3	.....
15	.....	1.55	2.45	2.25	.....	30	2.4	.....	2.9	2.5	.....
						31	2.3	.....	2.7	.....	.....

Daily discharge, in second-feet, of San Dieguito River near Del Mar, Cal., for the year ending Sept. 30, 1914.

Day.	Jan.	Feb.	Mar.	Apr.	May	Day.	Jan.	Feb.	Mar.	Apr.	May
1	.....	46	96	50	50	16	.....	2	13	.....	.....
2	.....	46	96	42	50	17	.....	2	13	.....	3
3	.....	33	76	34	50	18	.....	7	13	.....	10
4	.....	33	76	34	26	19	.....	.....	6	.....	2
5	.....	22	58	26	26	20	.....	.....	10	.....	.....
										.....	.....
6	.....	18	58	26	26	21	.....	.....	4	.....	.....
7	.....	14	58	26	13	22	.....	.....	6	.....	.....
8	.....	22	42	26	13	23	.....	.....	6	58	.....
9	.....	33	26	20	6	24	.....	.....	13	42	.....
10	.....	22	26	13	1	25	.....	.....	20	26	.....
11	.....	14	26	13	.....	26	.....	.....	20	13	.....
12	.....	18	26	10	.....	27	.....	116	20	13	.....
13	.....	14	20	13	.....	28	.....	106	42	13	.....
14	.....	9	20	6	.....	29	130	.....	67	6	.....
15	.....	2	20	4	.....	30	75	.....	96	26	.....
						31	60	.....	58	.....	.....

NOTE.—Channel dry Oct. 1 to Jan. 26 and May 22 to Sept. 30; discharge May 17 estimated. Estimates not made for the period *Feb. 19–26, the stage being* above the range covered by discharge measurements.

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Monthly discharge of San Dieguito River near Del Mar, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0	0	0.0	0	
November	0	0	.0	0	
December	0	0	.0	0	
March	96	4	36.5	2,240	B.
April	58	0	18.0	1,070	C.
May	50	0	8.9	547	C.
June	0	0	.0	0	
July	0	0	.0	0	
August	0	0	.0	0	
September	0	0	.0	0	

BLACK CANYON CREEK NEAR MESA GRANDE, CAL.

LOCATION.—In the NE. ¼ sec. 17, T. 12 S., R. 2 E., 1 mile above junction with Santa Ysabel Creek, and about 4 miles southwest of Mesa Grande.

DRAINAGE AREA.—15.2 square miles (measured on topographic map).

RECORDS AVAILABLE.—February 14, 1913 to September 30, 1914. (Discharge measurements only prior to October 1, 1913.)

GAGE.—Inclined staff on left bank. Observer, W. J. Isbell.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Solid rock and boulders.

EXTREMES OF DISCHARGE.—Maximum stage, no data; channel practically dry about three months each year.

ACCURACY.—Discharge estimated for days on which gage was not read by interpolation between measurements and by comparison with other records in the Santa Ysabel drainage basin; results fair.

COOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

Discharge measurements of Black Canyon Creek near Mesa Grande, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 1	R. W. Day	0.15	(a)	Jan. 21	R. W. Day	0.55	1.5
8	do	.15	(a)	28	do	1.40	36
15	do	.15	(a)	Feb. 4	do	.80	5.4
22	do	.15	(a)	12	do	.68	2.8
29	do	.18	(a)	20	do	1.58	54
Nov. 5	do	.18	(a)	Mar. 5	F. C. Ebert	.93	10
12	do	.21	(a)	11	R. W. Day	.83	6.7
18	do	.18	(a)	18	do	.75	4.8
26	do	.24	0.1	25	do	.75	4.6
Dec. 3	do	.26	.1	Apr. 1	do	.80	6.3
10	do	.24	.1	8	do	.75	4.5
17	do	.26	.1	15	do	.66	3.1
24	do	.27	.1	26	do	.71	2.8
Jan. 3	do	.37	.3	29	do	.81	5.6
7	do	.33	.2	May 6	do	.71	3.6
14	do	.33	.2	13	do	.63	2.2

a Practically dry.

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discharge, in second-feet, of Black Canyon Creek near Mesa Grande, Cal., for the year ending Sept. 30, 1914.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.
	0.0	0.1	0.3	8.0	14	6.3	6.0
	.0	.1	.3	7.0	13	6.0	5.0
	.0	.1	.3	5.5	12	5.8	4.5
	.0	.1	.3	5.4	11	5.5	4.0
	.0	.1	.2	5.0	10	5.3	3.8
	.0	.1	.2	5.0	9.0	5.0	3.6
	.0	.1	.2	4.0	8.5	4.7	3.4
	.0	.1	.2	5.0	8.0	4.5	3.2
	.0	.1	.2	4.0	7.5	4.3	3.0
	.0	.1	.2	3.0	7.0	4.1	2.8
	.0	.1	.2	3.0	6.7	3.9	2.6
	.0	.1	.2	2.8	6.5	3.7	2.4
	2.5	.1	.2	2.8	6.2	3.5	2.2
	1.5	.1	.2	2.5	5.8	3.3	2.1
	.5	.1	1.5	2.5	5.5	3.1	2.1
	.1	.1	1.5	2.5	5.3	3.1	2.0
	.0	.1	1.5	2.5	5.0	3.1	1.9
	.0	.1	2.0	2.5	4.8	3.0	1.9
	2.5	.1	2.0	125	4.8	3.0	1.8
	2.5	.1	1.5	54	4.8	3.0	1.7
	1.5	.1	1.5	250	4.7	2.9	1.7
	.5	.5	1.5	100	4.7	2.9	1.6
	.1	.3	1.5	75	4.6	2.9	1.5
	.1	.1	2.5	50	4.6	2.8	1.5
	.1	.1	5.0	40	4.6	2.8	1.4
	.1	.1	40	30	4.6	2.8	1.3
	.1	.1	175	25	5.0	3.0	1.3
	.1	.2	36	15	5.0	3.0	1.2
	.1	.2	20	.....	8.0	5.6	1.1
	.1	.2	15	.....	10	6.0	1.1
	.....	.2	10	.....	7.0	.....	1.0

:.—Creek was practically dry October, August, and September. Discharge determined almost r by interpolation between measurements.

ily discharge of Black Canyon Creek near Mesa Grande, Cal., for the year ending Sept. 30, 1914.

Month.	Mean discharge in second-feet.	Run-off (total in acre-feet).	Month.	Mean discharge in second-feet.	Run-off (total in acre-feet).
r.....	0.00	0	May.....	2.41	148
ber.....	.41	24	June.....	[a] 1.0	60
ber.....	.13	8	July.....	[a] .15	9
y.....	10.4	640	August.....	.0	0
ry.....	29.9	1,660	September.....	.0	0
.....	7.04	433			
.....	3.96	236	The year.....	4.44	3,220

[a] Estimated.

:.—See statement under "Accuracy" in description.

TEMESCAL CREEK NEAR ALMOND, CAL.

TION.—In the NW. ¼ sec. 23, T. 12 S., R. 1 E., about 400 feet above junction ith Santa Ysabel Creek and 1½ miles south of Almond.

AGE AREA.—31.5 square miles (measured on topographic map).

RDS AVAILABLE.—February 15, 1913, to September 30, 1914. (Discharge measrements only prior to October 1, 1913.)

.—Inclined staff on right bank. Observer, C. M. De Venelle.

ARGE MEASUREMENTS.—Made by wading near gage.

NEL AND CONTROL.—Shifting sand.

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EXTREMES OF DISCHARGE.—Maximum stage unknown; channel practically dry several months each year.

ACCURACY.—Discharge for days on which gage was not read estimated by interpolation between measurements and by comparison with the records at other stations in the Santa Ysabel drainage basin. Results are fair.

COOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

Discharge measurements of Temescal Creek near Almond, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 2	R. W. Day	0.52	0.1	Feb. 5	R. W. Day	1.47	1.6
9	do	.52	.1	10	do	1.42	1.0
19	do	.47	(a)	17	do	1.44	.9
23	do	.51	.05	24	do	2.10	25
28	do	.48	(a)	Mar. 3	do	1.90	7.5
Nov. 6	do	.49	.1	4	F. C. Ebert	1.95	7.8
13	do	.73	2.5	11	R. W. Day	1.74	5.0
23	do	.51	.1	19	do	1.70	3.4
Dec. 2	do	.51	.1	26	do	1.57	2.7
11	do	.53	.1	31	do	1.54	6.3
18	do	.53	.3	Apr. 6	do	1.54	3.6
23	do	.73	.6	13	do	1.45	2.8
Jan. 8	do	.58	.3	27	do	1.35	3.0
16	do	.64	.6	May 1	do	1.27	4.5
22	do	.57	.4	4	do	1.26	3.2
27	do	2.41	235	7	do	1.20	2.1
29	do	1.75	12	11	do	1.18	1.6
Feb. 1	do	1.47	2.7	Aug. 26	W. J. Isbell	.95	(a)

a Practically dry.

Daily discharge, in second-feet, of Temescal Creek near Almond, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.
1	0.1	0.05	0.1	0.2	2.7	9.0	6.0	4.5
2	.1	.1	.1	.2	2.0	8.0	6.0	4.0
3	.1	.1	.1	.2	1.6	7.5	5.4	3.5
4	.1	.1	.1	.2	1.6	7.8	4.8	3.2
5	.1	.1	.1	.2	1.6	7.4	4.2	2.8
6	.1	.1	.1	.2	1.6	7.0	3.6	2.4
7	.1	.1	.1	.2	1.0	6.5	3.5	2.1
8	.1	.1	.1	.3	1.6	6.1	3.4	2.0
9	.1	.05	.1	.3	1.0	5.7	3.3	1.8
10	.1	.05	.1	.3	1.0	5.4	3.2	1.7
11	.1	.05	.1	.3	1.0	5.0	3.1	1.6
12	.1	1.0	.2	.3	1.0	4.8	3.0	1.6
13	.1	2.5	.1	.3	1.0	4.6	2.8	1.5
14	.1	1.5	.2	.3	.9	4.4	2.8	1.5
15	.1	.5	.3	.6	.9	4.2	2.8	1.4
16	.1	.1	.3	.6	.9	4.0	2.8	1.4
17	.1	.1	.3	.6	.9	3.8	2.8	1.3
18	.05	.1	.3	.8	.9	3.6	2.8	1.3
19	.05	2.5	.3	.9	150	3.4	2.8	1.2
20	.05	2.5	.3	.6	50	3.3	2.9	1.2
21	.05	1.5	.3	.4	300	3.2	2.9	1.1
22	.05	.5	1.0	.4	150	3.1	2.9	1.1
23	.05	.1	.6	.4	75	3.0	2.9	1.0
24	.05	.1	.4	1.0	25	2.9	3.0	1.0
25	.05	.1	.2	2.5	20	2.8	3.0	.9
26	.05	.1	.2	50	15	2.7	3.0	.9
27	.05	.1	.2	235	10	3.0	3.0	.8
28	.05	.1	.2	20	10	3.0	3.0	.8
29	.05	.1	.2	12	.....	6.0	3.0	.7
30	.05	.1	.2	6.0	.....	9.0	4.5	.7
31	.05	.....	.2	4.0	.....	6.3	.....	.7

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Monthly discharge of Temescal Creek near Almond, Cal., for the year ending Sept. 30, 1914.

Month.	Mean discharge in second-feet.	Run-off (total in acre-feet).	Month.	Mean discharge in second-feet.	Run-off (total in acre-feet).
October	0.077	5	May	1.67	103
November	.483	29	June	a.70	42
December	.23	14	July	a.10	6
January	10.9	670	August	.00	0
February	29.6	1,640	September	.00	0
March	5.05	311			
April	3.44	205	The year	4.18	3,020

a Estimated.

NOTE.—See "Accuracy" in station description.

EAST SAN PASQUAL DITCH NEAR ESCONDIDO, CAL.

LOCATION.—In the NE. ¼ sec. 36, T. 12 S., R. 1 W., at upper end of San Pasqual Valley, about 9 miles southeast of Escondido.

RECORDS AVAILABLE.—1912 to 1914; station discontinued.

GAGE.—Gage heights determined by measuring distance to water surface from reference point at top of flume.

DISCHARGE MEASUREMENTS.—Made from foot plank across flume at gage or by wading.

CHANNEL AND CONTROL.—Considerable silt from the Santa Ysabel is deposited in the ditch.

ACCURACY.—No gage-height record obtained during year; only discharge measurements available.

COOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

The intake of San Pasqual ditch is on the left bank of the Santa Ysabel near the mouth of the canyon. From August 15 to January 15 this ditch is entitled to the entire flow of the stream; during the remainder of the year it has a right to divert 16 second-feet for 10 consecutive days out of each 30.

Discharge measurements of East San Pasqual ditch near Escondido, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 27	R. W. Day	.....	Dry.	Feb. 27	R. W. Day	.....	Dry.
Nov. 3	.....do	.....	Dry.	Mar. 6	.....do	1.13	10
10	.....do	.....	Dry.	13	.....do	1.45	16
21	.....do	0.81	3.0	27	.....do	.....	Dry.
Dec. 5	.....do	.....	Dry.	Apr. 3	.....do	.....	Dry.
15	.....do	.....	Dry.	10	.....do	1.24	11
26	.....do	.....	Dry.	17	.....do	1.25	14
Jan. 5	.....do	.....	Dry.	24	.....do	1.18	12
12	.....do	.....	Dry.	May 8	.....do	1.26	12
19	.....do	.....	Dry.	June 12	C. E. Hickok	.35	3.0
30	.....do	.....	Dry.				

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WEST SAN PASQUAL DITCH NEAR ESCONDIDO, CAL.

LOCATION.—In sec. 34, T. 12 S., R. 1 W., at upper end of San Pasqual Valley, about 7 miles southeast of Escondido.

RECORDS AVAILABLE.—1912 to September 30, 1914, when station was discontinued.

GAGE.—Vertical staff fastened to side of old culvert about 800 feet below head gate.

DISCHARGE MEASUREMENTS.—Made from foot plank across ditch near gage or by wading.

CHANNEL AND CONTROL.—Considerable silt from the Santa Ysabel is deposited in the ditch.

ACCURACY.—Discharge computed from rating curves covering short periods and by indirect method for shifting channels. Results fair.

COOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

The intake of this ditch is below that of the East San Pasqual ditch and on the opposite side of the Santa Ysabel. From January 16 to August 14, if there is not sufficient water in the stream for both ditches, the West San Pasqual ditch may take 16 second-feet for 20 consecutive days out of each 30.

Discharge measurements of West San Pasqual ditch near Escondido, Cal., during the year ending Sept. 30, 1914.

[Made by R. W. Day.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Jan. 19	2.56	9.0	Mar. 13	2.18	7.2	Apr. 17	1.86	3.7
30	1.85	3.2	27	2.33	8.2	24		Dry.
Feb. 27	1.95	5.3	Apr. 3	2.12	5.9	May 8		Dry.
Mar. 6	2.19	7.1	10	2.00	4.6	June 12		Dry.

Daily discharge, in second-feet, of West San Pasqual ditch near Escondido, Cal., for the year ending Sept. 30, 1914.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	0.0	0.0	0.0	7	9.5	0.0	0.0	6.5
2	.0	.0	.0	7.5	9	.0	.0	7.5
3	.0	.0	.0	7	9	6	.0	7.5
4	.0	.0	.0	11	8	4.5	7.5	8
5	.0	.0	.0	.0	8	.0	4	.0
6	.0	.0	.0	.0	7	.0	.0	.0
7	.0	.0	.0	.0	6	4	.0	.0
8	.0	.0	.0	.0	7	4.5	.0	5
9	.0	.0	.0	.0	.0	3	2.5	.0
10	.0	.0	.0	.0	4	4.5	.0	.0
11	.0	.0	.0	.0	6	4	6.5	.0
12	.0	.0	.0	6	5	3.5	5	.0
13	8	.0	.0	9	7	5	5	.0
14	.0	.0	.0	1.5	7	4	10	.0
15	.0	.0	.0	7.5	7	4.5	11	.0
16	.0	.0	.0	9	.0	3	.0	.0
17	.0	.0	.0	12	7	3.5	7.5	.0
18	.0	.0	9	11	8.5	9.5	8	.0
19	1	.0	9	13	6.5	7.5	7.5	.0
20	.0	.0	.8	.0	6	10	8	.0
21	.0	.0	.0	.0	9.5	12	6.5	.0
22	.0	.0	.0	12	9	10	4	.0
23	.0	10	.0	14	7	.0	6.5	.0
24	.0	8.5	.1	16	8	.0	.0	.0
25	.0	.0	10	.0	8	.0	.0	.0
26	.0	.0	10	.0	7	.0	.0	.0
27	.0	.0	13	5.5	8	10	6.5	.0
28	.0	.0	2	.0	2	12	9.5	.0
29	.0	.0	2	.....	3.5	.1	.0	.0
30	.0	.0	3	.....	4	.0	.0	.0
31	.....	.0	8	.....	2.5	.....	.0	.....

NOTE.—Ditch dry during October, July, August, and September. See also "Accuracy" in the station description.

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Monthly discharge of West San Pasqual ditch near Escondido, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0.0	0.0	0.00	0	
November	8	.0	.30	18	
December	10	.0	.60	37	
January	13	.0	2.16	133	D.
February	16	.0	5.32	295	D.
March	9.5	.0	6.32	389	C.
April	12	.0	4.17	248	C.
May	11	.0	3.73	229	D.
June	8	.0	1.15	68	
July	.0	.0	.00	0	
August	.0	.0	.00	0	
September	.0	.0	.00	0	
The year	16	.0	1.96	1,420	

SANTA MARIA CREEK NEAR RAMONA, CAL.

LOCATION.—In the SE. ¼ SE. ¼ sec. 11, T. 13 S., R. 1 W., about 5½ miles west of Ramona.

DRAINAGE AREA.—57.3 square miles (measured on topographic map).

RECORDS AVAILABLE.—November 6, 1912, to September 30, 1914.

GAGE.—Record beginning January 17, 1914, from Friez water-stage recorder on right bank with staff in two sections on opposite bank.

DISCHARGE MEASUREMENTS.—Made from cable 100 feet below gage or by wading.

CHANNEL AND CONTROL.—Shifting sand above and below station. Concrete control installed just below gage at an outcropping of solid rock. Zero flow occurs at stage about 1.42 feet.

EXTREMES OF DISCHARGE.—Maximum stage 1913–14, from water-stage recorder, 5.00 feet at 2 a. m. February 21 (discharge, 904 second-feet); channel practically dry about one-third of each year (in 1914 from October 1 to November 3 and June 3 to September 30).

ACCURACY.—Channel was practically dry except for a few days in January, February, and March, 1914. During rest of the year discharge was ground water brought to the surface by bedrock outcropping just below gage. Rating curve fairly well defined; results good.

COOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

Discharge measurements of Santa Maria Creek near Ramona, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Dec. 6	R. W. Day	1.35	a 0.05	Feb. 28	R. W. Day	1.92	5.6
20	do	1.35	a .05	Mar. 4	F. C. Ebert	1.70	1.7
28	do	1.36	a .07	7	R. W. Day	1.51	.4
Jan. 3	do	1.35	a .05	14	do	1.39	a .15
10	do	1.35	a .05	21	do	1.37	a .10
22	F. C. Ebert	1.35	a .05	Apr. 11	do	1.36	a .08
29	R. W. Day	1.63	2.1	25	do	1.35	a .10
31	do	1.45	.6	May 2	do	1.38	a .15
Feb. 21	do	4.20	558	9	do	1.35	a .10
28	do	1.92	5.6	16	do	1.35	a .10

a Estimated.

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Daily discharge, in second-feet, of Santa Maria Creek near Ramona, Cal., for the year ending Sept. 30, 1914.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	0.0	0.05	0.05	0.3	4.7	0.4	0.2	0.05
2	.0	.05	.05	.2	3.8	.3	.2	.05
3	.0	.05	.05	.2	2.3	.2	.2	.....
4	.05	.05	.05	.2	1.8	.1	.1	.....
5	.05	.05	.05	.2	1.5	.1	.1	.....
6	.05	.05	.05	.2	1.0	.1	.2	.....
7	.05	.05	.05	.2	.9	.1	.1	.....
8	.05	.05	.05	.2	.3	.1	.1	.....
9	.05	.05	.05	.2	.3	.1	.05	.....
10	.05	.05	.05	.2	.3	.2	.05	.....
11	.05	.05	.05	.1	.3	.1	.05	.....
12	.05	.05	.05	.1	.3	.1	.05	.....
13	.05	.05	.05	.1	.2	.1	.05	.....
14	.05	.05	.05	.1	.2	.1	.05	.....
15	.05	.05	.05	.1	.2	.1	.06	.....
16	.05	.05	.05	.1	.2	.1	.05	.....
17	.05	.05	.05	.1	.2	.1	.05	.....
18	.05	.05	.1	.7	.2	.05	.05	.....
19	.05	.05	.1	71	.1	.05	.05	.....
20	.05	.05	.1	90	.1	.05	.05	.....
21	.05	.05	.1	439	.1	.05	.05	.....
22	.05	.4	.1	35	.1	.05	.05	.....
23	.05	.5	.1	21	.1	.4	.05	.....
24	.05	.2	.1	15	.1	.2	.05	.....
25	.05	.05	.1	10	.1	.05	.05	.....
26	.05	.05	5.2	7.6	.2	.05	.05	.....
27	.05	.05	274	6.9	.2	.1	.05	.....
28	.05	.05	18	5.9	.2	.1	.05	.....
29	.05	.05	1.7	.....	.2	.1	.05	.....
30	.05	.05	.4	.....	1.0	.2	.05	.....
31	.....	.05	.4	.....	.6	.....	.05	.....

NOTE.—Discharge determined from a well-defined rating curve. Channel practically dry during October, June, July, August, and September. Discharge Nov. 30 interpolated.

Monthly discharge of Santa Maria Creek near Ramona, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0.0	0.0	0.0	0	
November	.05	.0	.04	2	
December	.5	.05	.08	5	
January	274	.05	9.72	598	C.
February	439	.1	25.2	1,400	B.
March	4.7	.1	.70	43	
April	.4	.05	.13	7.7	
May	.2	.05	.08	5	
June	.05	.0	[a].01	.6	
July	.0	.0	.0	0	
August	.0	.0	.0	0	
September	.0	.0	.0	0	
The year	439	.0	2.84	2,060	

[a] Estimated.

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SAN LUIS REY RIVER BASIN.

SAN LUIS REY RIVER[1] NEAR WARNER SPRINGS, CAL.

LOCATION.—In the NE. ¼ sec. 17, T. 10 S., R. 3 E., in San Jose del Valle grant, about 3½ miles above junction with West Fork of San Luis Rey River, and 4 miles northwest of Warner Springs.

DRAINAGE AREA.—35.8 square miles (measured on topographic map).

RECORDS AVAILABLE.—January 25, 1913, to September 30, 1914.

GAGE.—Sanders & Rising water-stage recorder on left bank with staff in two sections on opposite bank.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Shifting sand. A concrete control has been built across the channel just below gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, about 4.0 feet, crest of flood of January 27 (discharge, 233 second-feet); minimum stage recorded, 2.15 feet, during parts of October, June, August, and September (discharge, 0.6 second-foot).

1913–1914: Maximum stage recorded, about 4.0 feet, crest of flood of January 27, 1914 (discharge, 233 second-feet); minimum stage recorded, 2.2 feet, August 23 to 25, 1913 (discharge, 0.4 second-foot).

ACCURACY.—On account of the large number of discharge measurements made and slight change in stage, daily discharge was computed mainly by interpolation between measurements and by comparison with record on San Luis Rey River and West Fork of San Luis Rey River near Mesa Grande. Discharge January 26–28, 1914 (period not covered by gage-height record), was 12 per cent of the discharge of San Luis Rey River near Mesa Grande. Indirect method for shifting channels, based on a curve defined by high-water measurements, was used for estimating discharge February 19 to March 4, 1914; results fair.

COOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

Discharge measurements of San Luis Rey River near Warner Springs, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 6	F. C. Ebert	2.21	0.8	Feb. 22	W. J. Isbell	2.90	61
14	W. J. Isbell	2,21	.7	23	....do	2.78	36
20	....do	2.20	.7	25	James Ridder	2.75	13
Nov. 3	....do	2.21	.6	Mar. 4	W. J. Isbell	2.64	1.0
10	....do	2.21	.7	11	....do	2.62	.8
14	....do	2.22	1.0	18	....do	2.55	.9
17	....do	2.22	1.0	25	....do	2.63	.9
24	....do	2.20	.9	30	....do	2.48	1.1
Dec. 2	....do	2.21	1.0	Apr. 1	J. E. Ridder	2.59	1.2
10	....do	2.22	1.0	8	W. J. Isbell	2.33	.9
17	....do	2.22	1.0	15	....do	2.27	.8
23	....do	2.22	1.1	22	....do	2.31	1.3
Jan. 1	....do	2.20	.8	29	....do	2.23	1.0
8	....do	2.18	.9	May 6	....do	2.20	.8
14	....do	2.17	.8	13	....do	2.20	.8
17	....do	2.34	3.1	20	....do	2.20	1.0
22	....do	2.18	.8	27	....do	2.20	.9
30	....do	2.22	1.9	June 3	....do	2.18	.6
Feb. 4	....do	2.19	.8	18	....do	2.18	.6
11	....do	2.17	.7	July 9	....do	2.17	.7
18	....do	2.22	1.0	Aug. 20	F. C. Ebert	2.18	.6
19	....do	3.70	181	Sept. 10	W. J. Isbell	2.18	.8

[1] Local name is Puerta la Cruz Creek.

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Discharge, in second-feet, of San Luis Rey River near Warner Springs, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.7	0.6	1.0	0.8	1.5	6.0	1.2	1.0	0.7	0.7	0.6	.....
2	.7	.6	1.0	.8	1.5	3.0	1.2	.9	.7	.7	.6	.....
3	.7	.6	1.0	.8	1.0	1.0	1.1	.9	.6	.7	.6	.....
4	.8	.6	1.0	.8	.8	1.0	1.1	.9	.6	.7	.6	.....
5	.8	.6	1.0	.9	.8	1.0	1.0	.9	.6	.7	.6	.....
6	.8	.6	1.0	.9	.8	1.0	1.0	.8	.6	.7	.6	.....
7	.8	.7	1.0	.9	.8	.9	.9	.8	.6	.7	.6	.....
8	.8	.7	1.0	.9	.8	.9	.9	.8	.6	.7	.6	.....
9	.8	.7	1.0	.9	.8	.8	.9	.8	.6	.7	.6	.....
10	.8	.7	1.0	.9	.8	.8	.9	.8	.6	.7	.6	0.8
11	.7	.7	1.0	.9	.7	.8	.9	.8	.6	.7	.6	.....
12	.7	.7	1.0	.8	.7	.8	.9	.8	.6	.7	.6	.....
13	.7	.8	1.0	.8	.7	.8	.8	.8	.6	.7	.6	.....
14	.7	1.0	1.0	.8	.7	.8	.8	.8	.6	.7	.6	.....
15	.7	1.0	1.0	1.0	.7	.9	.8	.8	.6	.7	.6	.....
16	.7	1.0	1.0	2.0	.7	.9	.8	.9	.6	.7	.6	.....
17	.7	1.0	1.0	3.1	.7	.9	.9	.9	.6	.7	.6	.....
18	.7	1.0	1.0	4.5	1.0	.9	1.0	1.0	.6	.7	.6	.....
19	.7	1.0	1.0	6.0	98	.9	1.0	1.0	.6	.7	.6	.....
20	.7	1.0	1.0	3.0	183	.9	1.1	1.0	.6	.7	.6	.....
21	.7	.9	1.1	1.5	204	.9	1.2	1.0	.6	.7	.6	.....
22	.7	.9	1.1	.8	113	.9	1.3	1.0	.6	.7	.6	.....
23	.7	.9	1.1	.8	38	.9	1.3	1.0	.6	.7	.6	.....
24	.7	.9	1.1	.8	22	.9	1.2	.9	.6	.7	.6	.....
25	.7	.9	1.1	3.0	13	.9	1.2	.9	.6	.7	.6	.....
26	.7	.9	1.1	105	12	.9	1.1	.9	.6	.7	.6	.....
27	.7	.9	1.0	120	10	1.0	1.1	.9	.6	.7	.6	.....
28	.7	.9	1.0	21	9	1.0	1.0	.9	.6	.7	.6	.....
29	.6	1.0	.9	2.0	.....	1.1	1.0	.8	.6	.7	.6	.....
30	.6	1.0	.9	1.9	.....	1.2	1.0	.8	.6	.7	.6	.....
31	.6	.....	.8	1.5	.....	1.2	.....	.7	.....	.7	.6	.....

NOTE.—Mean monthly discharge for September estimated at 0.70 second-foot. See remarks under "Accuracy" in the station description.

Monthly discharge of San Luis Rey River near Warner Springs, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0.8	0.6	0.71	44	
November	1.0	.6	.83	49	
December	1.1	.8	1.01	62	
January	12.0	.8	9.35	575	C.
February	204	.7	25.6	1,420	C.
March	6	.8	1.16	71	
April	1.3	.8	1.02	61	
May	1.0	.7	.88	54	
June	.7	.6	.60	36	
July	.7	.7	.70	43	
August	.6	.6	.60	37	
September	.....	.....	.70	42	
The year	20.4	.6	3.45	2,490	

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SAN LUIS REY RIVER NEAR MESA GRANDE, CAL.

ATION.—In the NE. ¼ sec. 9, T. 11 S., R. 2 E., at concrete weir 1 mile below Warner dam site, and about 5 miles north of Mesa Grande.

AINAGE AREA.—209 square miles (revised estimate; measured on military survey and United States Geological Survey topographic maps).

CORDS AVAILABLE.—October 3, 1911, to September 30, 1914.

GE.—Barrett & Lawrence water-stage recorder on left bank just above weir; staff gage in two sections at same location.

SCHARGE MEASUREMENTS.—Made from car and cable about 1 mile above gage or by wading.

IANNEL AND CONTROL.—Sand and gravel; somewhat shifting. Concrete weir acts as control for gage.

XTREMES OF DISCHARGE.—Maximum stage recorded during year and for period 1912–1914, 7.5 feet at 7.40 and 10.30 a. m. February 21, 1914 (discharge, 3,470 second-feet); minimum stage recorded, 0.09 foot August 31, 1914 (discharge estimated at 0.2 second-foot).

CCURACY.—At low water sand collects at the weir, causing slightly shifting channel conditions. Frequent discharge measurements are made and the results are good.

OOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

Discharge measurements of San Luis Rey River near Mesa Grande, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 1	W. J. Isbell	0.10	0.9	Feb. 15	W. J. Isbell	0.37	12
6	F. C. Ebert	.10	1.1	17	do	.39	11
16	W. J. Isbell	.11	1.0	19	do	2.84	651
22	do	.12	1.2	20	do	2.56	594
29	do	.14	1.2	21	do	7.20	3,270
Nov. 1	do	.13	1.0	21	do	5.10	1,920
8	do	.16	1.1	24	do	1.14	148
12	do	.18	1.7	26	do	.88	94
13	do	.31	6.8	28	James Ridder	.81	73
26	do	.22	3.4	Mar. 3	W. J. Isbell	.72	48
Dec. 1	do	.20	2.0	7	do	.63	30
12	do	.21	2.0	9	do	.61	34
20	do	.21	2.6	12	do	.54	24
23	do	.28	5.0	14	do	.52	27
28	do	.24	3.4	20	do	.46	19
Jan. 5	do	.22	3.0	23	do	.45	19
7	do	.21	2.4	26	do	.51	23
12	do	.21	2.3	28	do	1.12	167
16	do	.31	6.7	Apr. 10	do	.47	19
17	do	.35	11	13	do	.43	14
18	do	.35	13	16	do	.42	12
19	do	.55	29	20	do	.39	9.1
21	do	.33	9.2	24	F. C. Ebert	.51	24
23	do	.34	10	25	do	.50	23
23	F. C. Ebert	.34	9.7	May 2	W. J. Isbell	.54	24
25	W. J. Isbell	.50	26	8	do	.39	11
26	do	3.52	1,090	10	F. C. Ebert	.39	11
27	do	4.22	1,440	14	W. J. Isbell	.38	10
27	do	2.87	722	19	do	.39	8.1
28	do	1.17	155	28	do	.30	6.0
28	do	.94	130	June 13	do	.26	3.0
29	do	.72	79	19	do	.23	2.1
30	do	.71	51	27	do	.24	1.2
31	do	.60	39	July 9	do	.20	.8
Feb. 2	do	.51	27	24	do	.18	.6
3	do	.49	25	30	do	.85	69
5	James Ridder	.48	20	Aug. 21	F. C. Ebert	.18	1.0
6	do	.46	19	29	W. J. Isbell	.16	1.2
9	W. J. Isbell	.43	16	Sept. 11	do	.14	.8
12	do	.41	12				

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Daily discharge, in second-feet, of San Luis Rey River near Mesa Grande, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.9	1.0	2.0	2.9	40	60	34	24	6	1.4	2.7	0.3
2	.9	1.0	3.2	2.9	27	57	37	24	6	1.5	2.6	.4
3	1.0	1.0	3.4	2.9	25	48	30	16	6	1.5	2.5	.6
4	1.0	1.0	3.4	2.9	24	43	23	16	6	1.5	2.4	1.7
5	1.1	1.1	3.2	2.9	20	41	22	16	5	1.4	2.3	1.3
6	1.1	1.1	3.2	2.9	19	37	22	18	5	1.2	2.0	1.1
7	1.1	1.1	2.8	2.9	18	30	21	16	5	1.0	2.2	1.3
8	1.1	1.1	2.8	2.9	17	31	21	13	5	.9	2.2	1.7
9	1.1	1.1	3.2	2.9	16	34	21	12	5	.8	1.8	1.5
10	1.1	1.1	3.2	3.2	13	32	20	12	5	.8	1.3	1.1
11	1.1	1.1	2.0	2.8	13	28	18	12	5	.8	1.3	.6
12	1.1	2.2	2.0	2.3	12	26	18	11	4	.8	1.2	.6
13	1.1	6.2	2.0	2.3	12	26	14	10	3.3	.8	1.1	.6
14	1.1	2.4	2.3	2.5	12	27	14	10	3.2	.9	1.1	.6
15	1.1	2.4	2.5	3.5	13	24	12	10	3.1	.8	1.0	.6
16	1.1	2.4	1.8	27	11	24	11	9	2.3	.8	1.0	.4
17	1.1	2.4	2.5	14	11	20	12	9	2.3	.9	1.0	.3
18	1.2	2.4	2.2	25	75	20	10	9	2.2	.9	1.0	.4
19	1.2	2.4	2.4	28	900	19	12	8	2.1	.9	1.0	.4
20	1.2	2.4	2.6	16	1,380	19	9	8	1.9	.7	1.0	.4
21	1.2	2.4	3.2	9.2	2,460	19	12	10	2.2	.9	1.0	.6
22	1.2	2.4	4.8	8.8	553	19	49	8	2.0	.8	.3	.3
23	1.2	2.4	5.0	9.8	242	19	36	10	1.9	.6	.3	.3
24	1.2	2.4	5.0	11	163	18	23	10	1.7	.6	.4	1.5
25	1.2	2.4	5.0	26	128	20	23	10	1.5	.6	.4	1.3
26	1.2	2.4	4.3	875	97	21	22	10	1.4	.6	1.2	.3
27	1.2	2.5	4.0	1,000	87	22	23	8	1.2	.6	1.0	.6
28	1.2	2.4	3.4	174	73	119	26	6	1.4	.7	1.1	.3
29	1.2	2.2	3.4	88	.....	46	32	6	1.4	.7	1.2	.6
30	1.2	2.1	3.4	49	.....	122	24	6	1.4	15	.3	.3
31	1.1	.....	3.4	40	.....	43	.....	6	.....	2.7	.2	.....

NOTE.—Discharge determined from rating curves covering short periods and by indirect method for shifting channels. Discharge July 30 is mean of hourly discharges.

Monthly discharge of San Luis Rey River near Mesa Grande, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1.2	0.9	1.12	69	C.
November	6.2	1.0	2.02	120	B.
December	5.0	1.8	3.15	194	B.
January	1,000	2.3	78.8	4,840	B.
February	2,460	11	230	12,800	B.
March	122	18	35.9	2,210	B.
April	49	9	21.7	1,290	B.
May	24	6	11.4	701	B.
June	6	1.2	3.28	195	B.
July	15	.6	1.42	87	C.
August	2.7	.2	1.29	79	C.
September	1.7	.3	.82	49	
The year	2,460	.2	31.2	22,600	

SAN LUIS REY RIVER NEAR PALA, CAL.

LOCATION.—In the NW. ¼ sec. 31, T. 9 S., R. 1 W., above ford on road to Sickler's mill, about 4 miles southeast of Pala.

DRAINAGE AREA.—322 square miles (revised estimate; measured on military survey and United States Geological Survey topographic maps).

RECORDS AVAILABLE.—October 9, 1903, to June 30, 1911; November 14, 1912, to September 30, 1914.

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AGE.—Friez water-stage recorder on left bank 600 feet above ford. There is a staff gage in three sections at the same location. Prior to September 19, 1912, staff gage was about 50 feet above ford. November 13, 1906, datum at gage lowered 4.66 feet. New gage at independent datum.

ISCHARGE MEASUREMENTS.—Made from cable 550 feet below gage or by wading.

HANNEL AND CONTROL.—Sand, gravel, and boulders; shifting. On September 19, 1912, an artificial control, consisting of short concrete cut-off walls between the boulders, was built across the channel just below gage; control was damaged by the flood in 1914 and rebuilt September 28, 1914. Zero flow for new control about 5.7 feet.

XTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 12.5 feet at 9 a. m. February 21 (approximate discharge, computed from extension of rating curve, 6,680 second-feet); minimum stage recorded, 5.34 feet August 19 (discharge, 1 second-foot; record incomplete).

1904–1914: Maximum stage recorded, 12.00[1] feet at noon and at 2 p. m. March 24, 1906 (approximate discharge, computed from extension of rating curve, 22,000 second-feet); minimum stage recorded, 5.28 feet August 6 and 7, 1907 (discharge, 0.6 second-foot). On February 1 and 2, 1906, the stage was 0.10[1] foot but the discharge was 10 second-feet.

IVERSIONS.—Water is diverted for irrigation on the Rincon Indian Reservation. The Escondido Mutual Water Co. diverts water from San Luis Rey River about 10 miles above the station. This water, which is stored at the Escondido reservoir, about 6 miles northeast of Escondido, is used for irrigation and for municipal supply at Escondido and vicinity. The capacity of the reservoir is 3,120 acre-feet. Water is diverted from Pauma Creek for irrigation on the Pauma Indian Reservation and Pauma Rancho. About 1 second-foot of water is diverted above the station for irrigation of the orchard at Sickler's mill on left bank below station.

CCURACY.—The high-water extension of the rating curve was developed from a study of the record on the San Luis Rey near Mesa Grande and the high-water curve for 1910. May 9 to September 30, 1914, the water was below the intake pipe of the recording-gage well, as the control was partly destroyed by the previous high water; discharge for this period interpolated between measurements and estimated by comparison with the record obtained at Mesa Grande. Similar methods were used earlier in the year for periods not covered by the gage-height record.

Discharge measurements of San Luis Rey River near Pala, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 6	F. C. Ebert	5.62	3.3	June 19	W. J. Isbell	5.48	4.0
Jan. 24	do	5.81	11	July 10	do	5.48	3.6
30	do	6.50	121	24	do	5.38	1.8
Mar. 1	do	6.53	147	Aug. 19	F. C. Ebert	5.34	1.1
9	do	5.97	41	Sept. 5	W. J. Isbell	5.46	2.5
28	do	6.25	77	9	F. C. Ebert	5.43	3.1
Apr. 25	do	6.02	51	28	do	5.87	1.4
May 9	do	5.70	18				
14	W. J. Isbell	5.68	16				
28	do	5.60	7.6				

[1] Add 4.66 feet to make comparable with present gage readings, as datum of gage was lowered 4.66 feet Nov. 13, 1906.

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Daily discharge, in second-feet, of San Luis Rey River near Pala, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	5	2	4	10	72	136	75	47	7	4	4	1
2	3	2	3	10	64	124	40	35	7	4	4	1
3	3	2	3	10	58	93	31	26	7	4	4	1
4	3	2	4	10	44	80	32	22	7	4	4	2
5	3	2	4	10	40	57	39	20	7	4	4	2
6	3	2	5	10	40	47	46	20	6	4	3	2
7	3	2	5	10	40	44	44	20	6	4	3	3
8	3	2	5	10	40	44	42	19	6	4	3	3
9	3	2	5	10	40	43	39	18	6	4	3	3
10	3	2	5	12	40	47	39	18	6	4	3	2
11	3	2	5	10	40	47	39	17	5	4	2	1
12	3	2	5	9	40	40	38	17	5	4	2	1
13	3	2	5	9	40	34	36	16	5	4	2	1
14	3	2	5	10	40	30	34	16	5	3	2	1
15	4	2	6	11	40	28	33	15	5	3	1	1
16	4	2	6	30	40	29	33	15	4	3	1	1
17	3	4	6	15	40	30	33	14	4	3	1	1
18	3	5	6	26	55	29	33	14	4	3	1	1
19	3	5	6	23	714	28	33	13	4	3	1	1
20	3	6	6	18	820	28	33	13	4	3	1	1
21	3	7	6	16	2,910	28	33	12	4	2	1	1
22	3	7	8	14	840	28	32	11	4	2	1	2
23	2	7	10	13	515	28	93	11	4	2	1	2
24	2	7	10	13	355	28	51	10	4	2	1	3
25	2	7	10	29	280	28	46	10	4	2	1	2
26	2	7	9	470	212	28	35	9	4	2	1	1
27	2	7	9	1,190	154	30	31	9	4	2	1	1
28	2	7	9	540	148	71	30	8	4	2	1	1
29	2	6	7	280	.....	100	32	8	4	2	1	1
30	2	5	9	146	.....	184	35	8	4	30	1	1
31	2	.....	10	110	.....	117	.....	8	.....	5	1	.....

NOTE.—Daily discharge Oct. 9–11, 20–25; Nov. 3–11, 20, 28–30; Dec. 1, 2, 18–20; Jan. 6–17; Feb. 7; Apr. 1, 2; May 8, 10–13, 15, 27, 29 to June 18; June 20 to July 9; July 11–23; July 25 to Aug. 18; Aug. 20 to Sept. 4; Sept. 6–8 and 10–27, estimated by interpolation and by comparison with record of the Mesa Grande station; discharge Feb. 18–21 computed from hourly mean discharge, on account of the rapid change in stage.

Monthly discharge of San Luis Rey River near Pala, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	5	2	2.8	172	C.
November	7	2	4.0	238	C.
December	10	3	6.3	387	C.
January	1,190	9	99.5	6,120	C.
February	2,910	40	277	15,400	C.
March	184	28	55.1	3,390	B.
April	93	30	41.3	2,460	B.
May	47	8	16.1	990	C.
June	7	4	5.0	298	
July	30	2	4.1	252	
August	4	1	1.9	117	
September	3	1	1.5	89	
The year	2,910	1	41.3	29,900	

SAN LUIS REY RIVER AT BONSALL, CAL.

LOCATION.—In the SW. ¼ SW. ¼ sec. 13, T. 10 S., R. 3 W., below concrete highway bridge at Bonsall, just below Moosa Canyon, about 14 miles below gaging station near Pala, and 14 miles above mouth of river.

DRAINAGE AREA.—465 square miles (measured on military survey and United States Geological Survey topographic maps).

RECORDS AVAILABLE.—April 16, 1912, to September 30, 1914.

GAGE.—Staff in three sections on right bank, 150 feet below bridge. Observers, E. H. Schlenz and Julian Cantarini.

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DISCHARGE MEASUREMENTS.—Made from bridge above gage or by wading.

CHANNEL AND CONTROL.—Sand, somewhat shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year and for period 1912–1914, 6.5 feet at 4.30 p. m. February 21 (approximate discharge, computed from extension of rating curve, 3,680 second-feet); channel practically dry five months of the year.

DIVERSIONS.—In addition to the diversions noted in connection with San Luis Rey River near Pala, Morena ditch and Pala Indian Reservation canal divert water in the vicinity of Pala for irrigation. Water for irrigation is also pumped from wells along the river.

ACCURACY.—High-water record approximate on account of shifting channel and lack of discharge measurements; results fair for medium and low water.

COOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

Discharge measurements of San Luis Rey River at Bonsall, Cal., during the year ending Sept. 30, 1914.

[Made by F. C. Ebert.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Jan. 17	1.31	7.3	Mar. 1	1.26	200	Apr. 25	1.10	43
24	1.34	16	10	1.12	64	May 9	1.01	20
31	1.25	147	28	1.02	44	14	.95	10
Feb. 4	.97	51	Apr. 18	.97	12			

Daily discharge, in second-feet, of San Luis Rey River at Bonsall, Cal., for the year ending Sept. 30, 1914.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	1	5	128	200	81	29	4
2	1	4	92	210	62	29	4
3	1	5	76	200	41	40	4
4	1	4	51	190	44	40	1
5	2	4	46	180	43	40	1
6	2	4	46	135	41	106	1
7	2	4	46	125	40	70	4
8	4	4	46	115	39	70	4
9	4	4	46	100	38	12	1
10	4	4	33	64	36	12	1
11	4	5	33	64	35	12	1
12	4	5	33	64	32	6	1
13	4	4	33	64	28	6	1
14	4	4	33	64	25	12	1
15	4	5	33	64	22	12	1
16	4	7	33	64	19	6	1
17	4	7	33	49	15	6	1
18	4	15	33	34	12	6	1
19	5	30	510	34	6	6	1
20	5	25	990	34	0	6	1
21	5	20	2,820	34	0	6	1
22	5	16	.....	34	18	6	1
23	7	16	.....	34	55	6	1
24	7	16	.....	34	40	6	1
25	5	27	.....	34	55	6	1
26	5	380	.....	34	40	6	0
27	5	1,530	.....	34	29	6	0
28	5	455	210	44	29	6	0
29	5	245	.....	121	29	6	0
30	5	166	.....	120	40	4	0
31	5	147	.....	137	.....	1	.....

NOTE.—Practically no flow Oct. 1 to Nov. 30 and June 26 to Sept. 30. Discharge Dec. 1 to Jan. 16 estimated. Discharge Jan. 17–25, Feb. 1–18, and Mar. 1 to Apr. 17 estimated from measurements and comparison with records of flow at Pala and Oceanside.

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Monthly discharge of San Luis Rey River at Bonsall, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0	0	0.0	0	
November	.....	0	.0	0	
December	7	1	4.0	246	D.
January	1,530	4	102	6,270	D.
February 1–21	2,820	33	247	10,300	D.
March	210	34	87.5	5,380	C.
April	81	0	33.1	1,970	C.
May	106	1	18.9	1,160	C.
June	4	0	1.3	77	D.
July	0	0	.0	0	
August	0	0	.0	0	
September	0	0	.0	0	

SAN LUIS REY RIVER NEAR OCEANSIDE, CAL.

LOCATION.—In the SW. ¼ SW. ¼ sec. 13, T. 11 S., R. 5 W., opposite Oceanside pumping plant, just above ford, 1½ miles above mouth of river, and about 2 miles northeast of Oceanside.

DRAINAGE AREA.—563 square miles (measured on military survey and United States Geological Survey topographic maps).

RECORDS AVAILABLE.—April 17, 1912, to September 30, 1914.

GAGE.—Staff in three sections on right bank. New staff in two sections on left bank opposite original gage, read on and after January 27, 1914. Observer, C. E. Peirce.

DISCHARGE MEASUREMENTS.—Made from concrete highway bridge three-fourths mile below gage or by wading.

CHANNEL AND CONTROL.—Sand; somewhat shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year and for period 1912–1914, 4.9 feet during the afternoon of February 21 (discharge, computed from extension of rating curve, 6,300 second-feet); channel dry two-thirds of year.

DIVERSIONS.—Several small canals divert water for irrigation in Mission Valley, above the station. See also San Luis Rey River at Bonsall. Water is also pumped from wells at various points in the valley. Record at this station shows quantity of water wasted into Pacific Ocean.

ACCURACY.—Record for February high water uncertain; results good otherwise.

COOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

Discharge measurements of San Luis Rey River near Oceanside, Cal., during the year ending Sept. 30, 1914.

[New gage.]

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 27	C. E. Hickok	3.62	1,740	Mar. 27	F. C. Ebert	1.30	20
28	do	3.06	743	Apr. 18	do	1.04	4.6
30	F. C. Ebert	a 2.27	155	25	do	1.46	46
Feb. 4	do	1.42	38	May 9	do	1.13	13
Mar. 9	do	1.62	79	14	do	.88	1.6
23	do	1.16	17				

a Old gage read 2.47 feet.

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Daily discharge, in second-feet, of San Luis Rey River near Oceanside, Cal., for the year ending Sept. 30, 1914.

Day.	Jan.	Feb.	Mar.	Apr.	May.	Day.	Jan.	Feb.	Mar.	Apr.	May.
1	.....	130	102	72	41	16	.....	29	41	15	1
2	.....	45	151	55	41	17	.....	24	29	11	.....
3	.....	43	124	41	41	18	.....	29	29	8	.....
4	.....	41	102	29	35	19	.....	408	29	4	.....
5	.....	41	102	41	29	20	.....	1,310	19	2	.....
6	.....	41	82	41	29	21	.....	2,650	19	2	.....
7	.....	35	72	48	19	22	.....	3,260	19	8	.....
8	.....	19	72	41	19	23	.....	1,410	19	41	.....
9	.....	29	72	29	11	24	.....	295	11	55	.....
10	.....	29	55	35	5	25	.....	180	11	55	.....
11	.....	29	72	35	5	26	.....	165	29	41	.....
12	.....	29	55	29	5	27	1,460	137	29	35	.....
13	.....	29	55	29	5	28	610	124	41	29	.....
14	.....	29	41	29	2	29	230	.....	72	29	.....
15	.....	15	41	19	2	30	150	.....	102	29	.....
						31	140	.....	180	.....	.....

NOTE.—Discharge determined from 2 fairly well defined rating curves. No flow Oct. 1 to Jan. 26 and May 17 to Sept. 30. Discharge Jan. 31 to Feb. 3 determined by indirect method for shifting channels.

Monthly discharge of San Luis Rey River near Oceanside, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0	0	0.0	0	
November	0	0	.0	0	
December	0	0	.0	0	
January	1,460	0	83.5	5,130	B.
February	3,260	19	379	21,000	C.
March	180	11	60.5	3,720	B.
April	72	2	31.2	1,860	C.
May	41	0	9.4	578	C.
June	0	0	.0	0	
July	0	0	.0	0	
August	0	0	.0	0	
September	0	0	.0	0	
The year	3,260	0	44.6	32,300	

AGUA CALIENTE CREEK NEAR WARNER SPRINGS, CAL.

LOCATION.—In San Jose del Valle grant, about 1 mile northwest of Warner Springs.

DRAINAGE AREA.—19.2 square miles (measured on topographic map).

RECORDS AVAILABLE.—February 5, 1913, to September 30, 1914 (fragmentary).

GAGE.—Vertical staff on left bank just above artificial control. Original gage was washed out March 6, 1914, and a new gage installed March 24, 1914, at an independent datum.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Shifting sand.

COOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

No estimates of discharge made.

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Discharge measurements of Agua Caliente Creek near Warner Springs, Cal., during the year ending Sept. 30, 1914.

[Made by W. J. Isbell.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Oct. 7	0.85	0.2	Feb. 4	1.10	2.2	May 9	0.41	1.1
17	.86	.1	Mar. 6	.....	4.0	20	.38	1.1
Jan. 9	.88	.2	24	.50	1.6	July 11	.39	.3
14	.88	.2	Apr. 15	.46	1.2			

Daily gage height, in feet, of Agua Caliente Creek near Warner Springs, Cal., for the year ending Sept. 30, 1914.

[W. J. Isbell, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	July.	Aug.	Sept.
1											
2											
3											
4					1.10						
5											
6											
7	0.85	0.84									
8											
9				0.88				0.41			
10											
11									0.39		
12											
13			0.89								
14				.88							
15							0.46				
16											
17	.86										
18		.84									
19											
20								.38		0.39	
21											
22											
23											
24		.84				0.5					
25											
26											
27											
28											
29											
30											
31											

NOTE.—Gage washed out Mar. 6, 1914; temporary gage installed Mar. 24, 1914; relation between gages not determined.

CANADA VERDE CREEK NEAR WARNER SPRINGS, CAL.

LOCATION.—At the mouth of canyon in San Jose del Valle grant, 1½ miles southeast of Warner Springs.

DRAINAGE AREA.—2.8 square miles (measured on topographic map).

RECORDS AVAILABLE.—February 5, 1913, to September 30, 1914 (discharge measurements only).

GAGE.—Vertical staff on right bank.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Shifting sand.

COOPERATION.—Maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

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Discharge measurements of Canada Verde Creek near Warner Springs, Cal., during the year ending Sept. 30, 1914.

[Made by W. J. Isbell.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Oct. 7	1.60	0.1	Feb. 4	1.76	0.8	May 4	.....	0.7
17	1.60	.1	Mar. 6	.....	.8	4	1.65	.7
Nov. 7	1.63	.2	6	1.76	1.0	9	1.66	.7
18	1.64	.2	19	1.65	.5	22	1.57	.4
24	1.67	.2	24	1.67	.8	June 15	1.57	.4
Dec. 13	1.76	.4	30	1.66	.8	July 11	1.61	.3
Jan. 9	1.77	.3	Apr. 9	1.63	.7	Sept. 16	1.61	.1
14	1.76	.3						

WEST FORK OF SAN LUIS REY RIVER[1] NEAR WARNER SPRINGS, CAL.

LOCATION.—In the SW. ¼ sec. 15, T. 10 S., R. 2 E., in San Jose del Valle grant, about 2¾ miles above junction with San Luis Rey River, and 7½ miles northwest of Warner Springs.

DRAINAGE AREA.—25.6 square miles (measured on topographic map).

RECORDS AVAILABLE.—January 25, 1913, to September 30, 1914.

GAGE.—Sanders & Rising water-stage recorder on left bank near mouth of canyon, with staff in two sections fastened to tree on same bank about 40 feet upstream.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Shifting sand. A concrete control has been built across channel just below gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year and for 1913–14, 4.39 feet from 4.30 p. m. to 10.30 p. m. February 19 (discharge, computed from extension of rating curve, 580 second-feet); channel dry about a third of each year—in 1913–14 from October 1 to November 11, December 7 to 18, and July 12 to September 30.

ACCURACY.—Discharge determined from fairly well defined rating curves covering short periods and by indirect method for shifting channels. For the period January 26–28, not covered by gage heights, the discharge was estimated as 22 per cent of that of San Luis Rey River near Mesa Grande.

COOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

Discharge measurements of West Fork of San Luis Rey River near Warner Springs, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 14	W. J. Isbell	.....	Dry.	Feb. 25	J. E. Ridder	2.96	56
20	do	.....	Dry.	Mar. 4	W. J. Isbell	2.64	22
Nov. 12	do	.....	Dry.	11	do	2.53	14
14	do	2.12	0.5	18	do	2.46	9.8
26	do	2.06	.1	25	do	2.46	9.3
Dec. 23	do	2.28	2.4	30	do	2.78	41
Jan. 1	do	2.18	.8	Apr. 1	J. E. Ridder	2.58	21
8	do	2.12	.3	8	W. J. Isbell	2.42	9.6
14	do	2.08	.3	15	do	2.42	9.6
22	do	2.33	2.9	22	do	2.52	17
29	do	2.70	36	29	do	2.51	14
Feb. 3	do	2.50	13	May 6	do	2.44	11
4	do	2.49	8.6	11	F. C. Ebert	2.40	7.0
11	do	2.41	5.7	13	W. J. Isbell	2.39	7.2
18	do	2.40	5.8	20	do	2.34	4.8
20	do	3.84	128	27	do	2.33	4.3
22	do	8.59	184	June 3	do	2.27	2.8
23	do	3.26	97	18	do	2.15	1.3

[1] Local name, Rincon Creek.

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Daily discharge, in second-feet, of West Fork of San Luis Rey River near Warner Springs, Cal., for the year ending Sept. 30, 1914.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1	.....	0.1	1.0	28	32	23	14	2.5	0.5
2	.....	.1	.5	27	23	19	18	2.5	.2
3	.....	.1	.5	13	23	18	15	2.5	.2
4	.....	.1	.5	8.5	23	14	15	2.5	.2
5	.....	.1	.5	9	23	18	11	2.5	.2
6	.....	.1	.5	9.5	19	17	11	2.5	.2
7	.....	.0	.5	10	19	13	11	3.5	.2
8	.....	.0	.2	14	19	12	8	7	.2
9	.....	.0	.2	15	15	10	7.5	3.5	.2
10	.....	.0	.2	20	15	10	7.5	14	.1
11	.....	.0	.2	5.5	15	10	7	8	.1
12	0.1	.0	.2	5.5	12	10	7	2.5	.....
13	.3	.0	.2	5.5	12	11	7	1.3	.....
14	.5	.0	.2	5.5	12	11	7	1.3	.....
15	.5	.0	1.5	5.5	13	9	7	1.3	.....
16	.4	.0	5	5.5	13	8.5	7	1.3	.....
17	.4	.0	5	5.5	13	8.5	7	1.3	.....
18	.4	.0	7.5	20	10	8.5	7	1.3	.....
19	.3	2.3	12	241	10	8.5	5	1.3	.....
20	.3	5	7.5	306	10	8.5	5	1.3	.....
21	.3	7.5	5	403	9.5	8.5	5	1.3	.....
22	.2	7.5	3.5	172	9.5	19	3.5	1.3	.....
23	.2	1.5	3.5	101	9	19	3.5	.8	.....
24	.2	.1	3.5	61	9	23	3.5	.8	.....
25	.1	.5	7.5	55	9	18	3.5	.8	.....
26	.1	.5	192	48	9	14	3.5	.8	.....
27	.1	.1	220	43	13	14	4.5	.8	.....
28	.1	.1	38	38	42	14	4.5	.8	.....
29	.1	.1	36	.....	22	14	3.5	.8	.....
30	.1	.2	35	.....	33	17	3.5	.8	.....
31	.....	1.5	30	.....	33	.....	3.5	.....	.....

NOTE.—Channel dry Oct. 1 to Nov. 11 and July 12 to Sept. 30. See "Accuracy" in station description.

Monthly discharge of West Fork of San Luis Rey River near Warner Springs, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0.0	0.0	0.00	0	
November	.5	.0	.16	10	
December	7.5	.0	.89	55	
January	220	.2	19.9	1,220	C.
February	403	5.5	60.0	3,330	B.
March	42	9	17.1	1,050	B.
April	23	8.5	13.6	809	B.
May	18	3.5	7.29	448	B.
June	14	.8	2.46	146	C.
July	.8	.0	.08	5	
August	.0	.0	.00	0	
September	.0	.0	.00	0	
The year	403	.0	9.78	7,070	

CARRIZO CREEK NEAR WARNER SPRINGS, CAL.

LOCATION.—At mouth of canyon, near southern boundary of Valle de San Jose grant, about 7½ miles southwest of Warner Springs.

DRAINAGE AREA.—4.9 square miles (measured on topographic map).

RECORDS AVAILABLE.—January 24, 1913, to September 30, 1914. (Discharge measurements only for 1912–13.)

GAGE.—Staff in two sections fastened to cottonwood tree on right bank. Observer, *W. J. Isbell.*

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DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Shifting sand. Timber control installed June 16, 1913.

ACCURACY.—Daily discharge estimated, for days on which gage was not read, by interpolation between measurements and by comparison with record for San Luis Rey River near Warner Springs; results fair.

COOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

Discharge measurements of Carrizo Creek near Warner Springs, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 6	W. J. Isbell	2.56	0.1	Feb. 24	do	2.76	4.0
14	do	2.55	.1	26	James Ridder	2.77	3.6
21	do	2.58	.2	Mar. 7	W. J. Isbell	2.62	1.2
29	do	2.57	.2	10	do	2.63	1.0
Nov. 1	do	2.57	.2	13	do	2.60	.8
11	do	2.55	.2	21	do	2.60	.8
17	do	2.55	.3	27	do	2.63	1.0
22	do	2.54	.3	29	do	2.63	1.0
25	do	2.56	.2	Apr. 10	do	2.63	.8
Dec. 15	do	2.57	.2	14	do	2.59	.4
29	do	.....	.3	17	do	2.58	.4
Jan. 9	do	2.55	.2	24	F. C. Ebert	2.60	.8
23	do	2.57	.4	30	W. J. Isbell	2.63	.9
24	do	2.60	.4	May 8	do	2.62	7
30	do	2.62	.7	11	do	2.60	.4
Feb. 3	do	2.64	.5	18	do	2.60	.5
9	do	2.60	.6	July 11	do	2.52	.6
12	do	2.61	.6	Sept. 9	do	2.53	.2

Daily discharge, in second-feet, of Carrizo Creek near Warner Springs, Cal., for the year ending Sept. 30, 1914.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.
1	0.1	0.2	0.2	0.3	0.8	2.0	1.0	0.9
2	.1	.2	.2	.3	.8	1.5	1.0	.9
3	.1	.2	.2	.3	.5	1.2	.9	.8
4	.1	.2	.2	.2	.5	1.2	.9	.8
5	.1	.2	.2	.2	.5	1.2	.9	.8
6	.1	.2	.2	.2	.5	1.2	.8	.7
7	.1	.2	.2	.2	.6	1.2	.8	.7
8	.1	.2	.2	.2	.6	1.1	.8	.7
9	.1	.2	.2	.2	.6	1.1	.8	.6
10	.1	.2	.2	.2	.6	1.0	.8	.5
11	.1	.2	.2	.2	.6	.9	.7	.4
12	.1	.2	.2	.2	.6	.9	.6	.4
13	.1	.2	.2	.2	.6	.8	.5	.4
14	.1	.2	.2	.2	.6	.8	.4	.4
15	.1	.3	.2	.5	.6	.8	.4	.5
16	.1	.3	.3	1.0	.6	.8	.4	.5
17	.1	.3	.2	1.6	.6	.8	.4	.5
18	.2	.3	.2	2.2	1.0	.8	.6	.5
19	.2	.3	.2	3.0	33	.8	.6	.5
20	.2	.3	.2	1.5	61	.8	.7	.5
21	.2	.3	.2	.8	68	.8	.8	.5
22	.2	.3	.2	.4	38	.8	1.0	.5
23	.2	.3	.2	.4	12	.8	.9	.5
24	.2	.2	.2	.4	4.0	.9	.8	.5
25	.2	.2	.3	1.5	3.8	.9	.8	.5
26	.2	.2	.3	32	3.6	1.0	.8	.5
27	.2	.2	.3	40	3.0	1.0	.8	.5
28	.2	.2	.3	7	2.5	1.0	.9	.5
29	.2	.2	.3	1.0	.....	1.0	.9	.5
30	.2	.2	.3	7	.....	1.0	.9	.5
31	.2	.....	.3	7	.....	1.0	.....	.5

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Monthly discharge of Carrizo Creek near Warner Springs, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	0.2	0.1	0.15	9.2
November	.3	.2	.23	14
December	.3	.2	.22	14
January	40	.2	3.56	219
February	68	.5	8.58	477
March	2.0	.8	1.00	61
April	1.0	.4	.75	45
May	.9	.4	.56	34
June	.....	.....	.50	30
July	.....	.....	.50	31
August	.....	.....	.40	25
September	.....	.....	.20	12
The year	68	.....	1.34	971

SUSANNA CREEK NEAR WARNER SPRINGS, CAL.

LOCATION.—At mouth of canyon, near southern boundary of Valle de San Jose grant, and about 7½ miles southwest of Warner Springs.

DRAINAGE AREA.—4.6 square miles (measured on topographic map).

RECORDS AVAILABLE.—February 1, 1913, to September 30, 1914. (Discharge measurements only for year 1912–13.)

GAGE.—Staff bolted to upstream side of left bridge abutment. Observer, W. J. Isbell.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Shifting sand. July 14, 1913, a plank was placed horizontally between abutments of bridge for a control.

EXTREMES OF DISCHARGE.—Maximum stage 1913–14 unknown; channel dry nearly half each year.

ACCURACY.—Discharge for days on which gage was not read estimated by interpolation between measurements and by comparison with the records on San Luis Rey River and Carrizo Creek near Warner Springs.

COOPERATION.—Maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

Discharge measurements of Susanna Creek near Warner Springs, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 14	W. J. Isbell	.....	Dry.	Feb. 26	James Ridder	0.75	6.2
21	.....do	.....	Dry.	Mar. 7	W. J. Isbell	.59	2.4
29	.....do	.....	Dry.	10	.....do	.58	2.2
Nov. 1	.....do	.....	Dry.	13	.....do	.57	2.1
11	.....do	.....	Dry.	21	.....do	.54	1.4
17	.....do	.....	Dry.	27	.....do	.56	1.9
25	.....do	.....	Dry.	29	.....do	.56	2.3
Dec. 29	.....do	0.45	0.2	Apr. 10	.....do	.53	1.4
Jan. 9	.....do	.43	.2	14	.....do	.51	1.1
23	.....do	.48	.7	17	.....do	.51	1.0
24	.....do	.48	.5	24	F. C. Ebert	.53	1.8
30	.....do	.67	3.3	30	W. J. Isbell	.57	3.1
Feb. 3	.....do	.57	2.2	May 8	.....do	.53	2.0
9	.....do	.53	1.1	11	F. C. Ebert	.51	1.4
12	.....do	.53	1.1	18	W. J. Isbell	.51	1.2
24	.....do	.81	2.8	Aug. 21	F. C. Ebert	.....	Dry.

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ischarge, in second-feet, of Susanna Creek near Warner Springs, Cal., for the year ending Sept. 30, 1914.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
		0.2	2.8	4.0	2.0	3.0	0.9
		.2	2.5	3.0	2.0	2.8	.8
		.2	2.2	2.4	1.9	2.7	.8
		.2	2.0	2.4	1.8	2.5	.8
		.2	1.8	2.4	1.7	2.4	.8
		.2	1.6	2.4	1.6	2.2	.7
		.2	1.4	2.4	1.5	2.1	.7
		.2	1.2	2.3	1.5	2.0	.7
		.2	1.1	2.3	1.4	1.8	.7
		.2	1.1	2.2	1.4	1.6	.6
		.2	1.1	2.2	1.3	1.4	.6
		.2	1.1	2.1	1.2	1.4	.6
		.2	1.1	2.1	1.1	1.4	.6
		.2	1.1	2.0	1.1	1.3	.5
		.5	1.1	1.9	1.1	1.3	.5
		1.0	1.1	1.8	1.1	1.2	.5
		1.6	1.1	1.7	1.1	1.2	.5
		2.2	1.5	1.6	1.2	1.2	.4
		3.0	35	1.5	1.4	1.2	.4
	0.1	1.5	65	1.4	1.6	1.2	.4
	.1	.8	70	1.4	1.8	1.1	.3
	.1	.7	40	1.4	2.0	1.1	.3
	.2	.7	15	1.4	1.9	1.1	.3
	.2	.5	2.8	1.6	1.8	1.1	.3
	.2	1.5	4.5	1.7	2.0	1.0	.2
	.2	35	6.2	1.9	2.2	1.0	.2
	.2	45	5.5	1.9	2.4	1.0	.2
	.2	10	4.5	2.1	2.6	1.0	.2
	.2	7.0	.....	2.3	2.8	.9	.1
	.2	3.3	.....	2.2	3.1	.9	.1
	.2	3.0	.....	2.1	.....	.9	.....

—Channel dry Oct. 1 to Dec. 19 and July 1 to Sept. 30. Also see remarks under "Accuracy" in the lescription.

ly discharge of Susanna Creek near Warner Springs, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
	0.0	0.0	0.00	0
er	.0	.0	.00	0
er	.2	.0	.07	4.3
	45	.2	3.87	238
y	70	1.1	9.84	546
	4.0	1.4	2.07	127
	3.1	1.1	1.72	102
	3.0	.9	1.52	93
	.9	.1	.49	29
	.0	.0	.00	0
	.0	.0	.00	0
er	.0	.0	.00	0
ıe year	70	.0	1.58	1,140

MATAGUAL CREEK NEAR WARNER SPRINGS, CAL.

ON.—In the SE. ¼ sec. 28, T. 11 S., R. 3 E., in Valle de San Jose grant, near uth of canyon, and about 5 miles southwest of Warner Springs.

AGE AREA.—9.2 square miles (measured on topographic map).

DS AVAILABLE.—November 16, 1912, to September 30, 1914. (Discharge asurements only for year 1912–13.)

—Depth of water over a reference point is measured in pool above artificial ıtrol. Observer, J. W. Isbell.

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DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Shifting sand. Control is of planks and approximately a Cippoletti weir.

ACCURACY.—Discharge for days on which gage was not read estimated by interpolation between measurements and by comparison with records on San Luis Rey River and Carrizo Creek near Warner Springs; results fair.

COOPERATION.—Station maintained in cooperation with Volcan Land & Water Co., through W. S. Post, engineer.

Discharge measurments of Matagual Creek near Warner Springs, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 6	W. J. Isbell	0.19	0.4	Feb. 26	James Ridder	0.75	4.9
14	do	.16	.3	Mar. 7	W. J. Isbell	.44	2.6
21	do	.19	.4	13	do	.40	1.8
29	do	.19	.4	21	do	.38	1.6
Nov. 17	do	.22	.6	27	do	.41	1.6
25	do	.23	.6	29	do	.42	1.9
Dec. 2	do	.23	.7	Apr. 10	do	.38	1.6
10	do	.24	.8	14	do	.33	1.2
17	do	.24	.7	May 2	do	.41	2.0
29	do	.24	.7	8	do	.37	1.5
Jan. 9	do	.24	.6	11	F. C. Ebert	.33	1.2
24	do	.26	.8	27	W. J. Isbell	.28	1.0
30	do	.42	2.8	June 4	do	.29	1.0
Feb. 3	do	.34	1.4	27	do	.20	.4
9	do	.30	1.2	July 10	do	.15	.2
12	do	.30	1.1	25	do	.17	.3
24	do	.85	7.4	Sept. 9	do	.18	.3

Daily discharge, in second-feet, of Matagual Creek near Warner Springs, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1	0.4	0.4	0.7	0.7	2.0	3.5	1.8	2.0	1.0	0.3
2	.4	.4	.7	.7	2.0	3.0	1.8	2.0	1.0	.3
3	.4	.4	.7	.7	1.4	2.6	1.8	1.9	1.0	.3
4	.4	.4	.7	.6	1.4	2.6	1.8	1.8	1.0	.3
5	.4	.4	.7	.6	1.3	2.6	1.7	1.8	1.0	.3
6	.4	.4	.8	.6	1.3	2.6	1.7	1.7	1.0	.2
7	.4	.5	.8	.6	1.3	2.6	1.7	1.6	.9	.2
8	.4	.5	.8	.6	1.2	2.4	1.7	1.5	.9	.2
9	.4	.5	.8	.6	1.2	2.2	1.6	1.4	.9	.2
10	.4	.5	.8	.6	1.2	2.2	1.6	1.3	.9	.2
11	.3	.5	.8	.6	1.1	2.0	1.5	1.2	.8	.2
12	.3	.5	.8	.6	1.1	1.9	1.4	1.2	.8	.2
13	.3	.5	.8	.6	1.1	1.8	1.3	1.2	.8	.2
14	.3	.5	.7	.6	1.1	1.8	1.2	1.3	.8	.2
15	.3	.6	.7	1.0	1.1	1.8	1.2	1.3	.7	.2
16	.3	.6	.7	2.0	1.1	1.7	1.2	1.3	.7	.2
17	.3	.6	.7	3.0	1.1	1.7	1.2	1.4	.7	.2
18	.4	.6	.7	4.5	2.0	1.7	1.5	1.4	.7	.3
19	.4	.6	.7	6.0	65	1.6	1.5	1.4	.6	.3
20	.4	.6	.7	5.0	120	1.6	1.5	1.5	.6	.3
21	.4	.6	.7	1.5	125	1.6	1.5	1.5	.6	.3
22	.4	.6	.7	.8	75	1.6	2.0	1.5	.6	.3
23	.4	.6	.7	.8	25	1.6	2.0	1.4	.5	.3
24	.4	.6	.7	.8	7.4	1.6	2.0	1.3	.5	.3
25	.4	.6	.7	3.0	6.0	1.6	2.0	1.2	.5	.3
26	.4	.6	.7	65	4.9	1.6	2.0	1.1	.4	.3
27	.4	.6	.7	80	4.5	1.6	2.0	1.0	.4	.3
28	.4	.6	.7	14	4.0	1.8	2.0	1.0	.4	.3
29	.4	.7	.7	2.0	.....	1.9	2.0	1.0	.4	.3
30	.4	.7	.7	2.8	.....	1.9	2.0	1.0	.4	.3
31	.4	.....	.7	2.5	.....	1.9	.....	1.0	.....	.3

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Monthly discharge of Matagual Creek near Warner Springs, Cal., for the year ending Sept. 30, 1914.

Month.	Mean discharge in second-feet.	Run-off (total in acre-feet).	Month.	Mean discharge in second-feet.	Run-off (total in acre-feet).
October	0.38	23	May	1.39	85
November	.54	32	June	.72	43
December	.73	45	July	.26	16
January	6.50	400	August	.30	18
February	16.5	916	September	.20	12
March	2.02	124			
April	1.67	99	The year	2.50	1,810

PALA INDIAN RESERVATION CANAL AT PALA, CAL.

LOCATION.—In the NW. ¼ SE. ¼ sec. 26, T. 9 S., R. 2 W., at sand box 300 feet above highway bridge, half a mile southeast of Pala.

RECORDS AVAILABLE.—June 17, 1912, to November 4, 1913 when the station was discontinued.

GAGE.—Vertical staff in sand box, showing head on steel plate at outlet. Observer, Allen Bowdish.

DISCHARGE MEASUREMENTS.—Made from foot plank across concrete-lined canal, below sand box.

ACCURACY.—Rating curve is well defined and results are good.

COOPERATION.—Maintained in cooperation with Volcan Land & Water Co., and United States Indian Service.

The following discharge measurements was made by F. C. Ebert:

October 6, 1913: Gage height, 0.43 foot; discharge, 4.0 second-feet.

Daily discharge, in second-feet, of Pala Indian Reservation canal at Pala, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Day.	Oct.	Nov.	Day.	Oct.	Nov.
1	3.6	4.8	11	4.8	.....	21	3.6	.....
2	3.6	4.8	12	4.4	.....	22	3.6	.....
3	3.2	.....	13	4.8	.....	23	3.6	.....
4	3.6	4.8	14	4.8	.....	24	3.6	.....
5	.....	.....	15	4.2	.....	25	3.6	.....
6	4.4	.....	16	3.6	.....	26	4.8	.....
7	3.6	.....	17	4.8	.....	27	4.8	.....
8	4.4	.....	18	4.8	.....	28	.....	.....
9	4.8	.....	19	4.4	.....	29	4.8	.....
10	4.8	.....	20	3.8	.....	30	4.8	.....
						31	4.8	.....

NOTE.—Canal not in operation after Nov. 5 and during rest of 1913–14; no record.

SANTA ANA RIVER BASIN.

SANTA ANA RIVER NEAR MENTONE, CAL.

LOCATION.—In the SW. ¼ SW. ¼ sec. 34, T. 1 N., R. 2 W., just above road crossing opposite Warm Springs Canyon, three-fourths mile below intake of Pacific Light & Power Corporation's canal, 2 miles above the mouth of the canyon, and about 5 miles northeast of Mentone.

DRAINAGE AREA.—182 square miles.

RECORDS AVAILABLE.—July 1, 1896, to September 30, 1914.

GAGE.—Vertical staff, on right bank about 100 feet above ford, installed February 25, 1910; various gages used prior to this date; original datum not maintained. Observer, A. W. Henn.

DISCHARGE MEASUREMENTS.—Made from cable just below gage or by wading.

CHANNEL AND CONTROL.—Gravel and boulders; shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.6 feet at 6 a. m.

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February 21 (discharge, 2,190 second-feet); minimum stage recorded, 2.3 feet during parts of every month from October to January (discharge, 0.6 second-foot).

1896–1914: Maximum stage recorded January 1, 1910, when gage was washed out (crest height unknown; mean discharge for day estimated at 8,500 second feet); minimum stage recorded, 2.3 feet during parts of every month from October, 1913, to January, 1914 (discharge, 0.6 second-foot).

DIVERSIONS AND STORAGE.—Southern California Edison Co.'s power plants Nos. 1 and 2 are 5¼ and 2¾ miles, respectively, above the Mentone plant at the mouth of the canyon. The intake of the Pacific Light & Power Corporation's canal is at plant No. 2. The tailrace from this plant discharges into the canal. The Greenspot pipe line diverts water from the forebay at the Mentone power house. Water is stored on Bear Creek at Bear Valley reservoir.

ACCURACY.—High-water record approximate owing to changes in channel and lack of discharge measurements; otherwise results are fair.

Discharge measurements of Santa Ana River near Mentone, Cal., during the year ending Sept. 30, 1914.

[Made by F. C. Ebert.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Oct. 7	2.30	0.6	Mar. 11	2.42	60	May 15	2.37	56
Jan. 14	2.34	.9	29	2.34	40	June 25	2.12	14
15	3.96	224	Apr. 16	2.38	42	Aug. 13	1.85	2.1
Feb. 6	2.31	9.8	May 1	2.55	88			
28	2.73	127	7	2.46	68			

Daily discharge, in second-feet, of Santa Ana River near Mentone, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.9	0.6	0.9	0.6	110	119	27	108	47	18	2	2
2	.9	.6	.9	.6	84	108	24	108	59	13	2	2
3	.9	.6	.9	.6	53	108	24	108	58	13	2	2
4	.9	.6	.9	.6	37	96	23	96	58	13	2	2
5	.9	.6	.9	.6	18	76	40	96	58	13	2	2
6	.9	.6	.9	.6	14	76	40	86	57	13	2	2
7	.6	.6	.9	.6	10	76	59	86	56	13	2	1
8	.6	.6	.6	.6	10	68	40	76	55	10	2	1
9	.6	.6	.6	.6	10	68	40	76	48	10	2	1
10	.6	.6	.6	.6	10	68	39	68	36	10	2	1
11	.6	.6	.6	.6	7	68	38	68	29	10	2	1
12	.6	.6	.6	.6	4	67	46	60	28	10	2	1
13	.6	31	.6	.6	4	60	45	60	26	10	2	1
14	.6	1.2	.6	.6	4	51	45	60	26	10	2	1
15	.6	.9	.6	171	2	50	44	60	26	3	2	1
16	.6	.6	.6	325	2	50	38	59	26	3	2	1
17	.6	.6	.6	50	2	49	31	58	26	3	2	1
18	.6	.6	.6	32	30	48	32	58	25	3	2	1
19	.6	12	.6	156	355	48	34	57	25	3	2	1
20	.6	12	.6	118	1,320	47	36	56	25	2	2	1
21	.6	4.5	.6	15	2,190	46	37	55	25	2	2	1
22	.6	1.2	.6	12	624	46	51	48	25	2	2	1
23	.6	1.2	.9	7	388	45	38	47	22	2	2	1
24	.6	.9	.9	7	206	39	39	46	22	2	2	1
25	.6	.9	.9	97	27	38	35	45	22	2	2	1
26	.6	.9	.9	1,020	27	37	31	39	18	2	2	1
27	.6	.9	.9	760	132	37	28	38	18	2	2	1
28	.6	.9	.6	315	132	40	24	38	18	2	2	1
29	.6	.9	.6	204	.....	40	200	37	18	2	2	1
30	.6	.9	.6	170	.....	36	142	48	18	2	2	1
31	.6	.....	.6	138	.....	28	.....	48	.....	2	2	.....

NOTE.—Discharge determined from rating curves covering short periods and by indirect method for shifting channels. Discharge June 30 interpolated.

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ily discharge of Santa Ana River near Mentone, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
r	0.9	0.6	0.66	41	
ber	31	.6	26.4	157	C.
ber	.9	.6	.72	44	
y	1,020	.6	116	7,130	C.
ry	2,190	2	208	11,600	C.
	119	28	59.1	3,630	C.
	200	23	45.7	2,720	C.
	108	37	64.3	3,950	C.
	59	18	33.3	1,980	C.
	18	2	6.6	406	C.
	2	2	2.0	123	D.
ber	2	1	1.2	71	D.
The year	2,190	.6	43.9	31,900	

ined daily discharge, in second-feet, of Santa Ana River and Pacific Light & Power poration's canal, including Greenspot pipe line, near Mentone, Cal., for the year ing Sept. 30, 1914.

ay.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
	53	31	30	35	184	200	107	187	124	102	79	65
	58	29	30	32	158	189	104	186	136	97	73	65
	56	26	27	32	129	189	104	186	136	97	73	63
	58	22	30	30	113	177	103	174	136	97	73	63
	61	22	27	32	96	157	120	174	136	97	73	63
	61	22	27	30	90	157	120	164	136	95	73	63
	61	22	27	30	85	157	139	164	134	95	73	62
	59	22	27	30	79	149	120	154	134	92	73	62
	61	22	27	30	79	149	120	154	132	92	73	62
	59	18	27	27	79	148	119	146	120	92	71	62
	59	24	27	30	73	148	118	146	112	92	69	61
	59	21	27	27	68	147	126	138	112	91	69	61
	54	105	29	27	68	140	125	138	110	91	69	64
	49	36	29	27	66	131	125	138	110	91	69	64
	56	29	26	250	66	130	124	138	110	84	69	64
	54	31	26	404	66	130	118	136	110	84	70	64
	56	29	26	130	66	129	109	136	110	84	70	64
	59	30	27	104	96	128	110	136	109	84	70	64
	57	86	27	236	435	128	112	134	109	84	69	64
	59	60	27	192	1,370	127	115	134	109	81	69	63
	55	41	27	94	2,240	126	116	134	109	81	69	63
	58	36	27	84	665	126	132	126	109	81	69	63
	55	31	35	74	429	125	119	124	104	81	69	56
	50	32	30	68	258	119	119	124	105	81	71	57
	52	30	30	176	108	118	115	122	105	81	71	62
	44	30	35	1,060	108	117	111	116	101	81	72	66
	44	30	32	830	213	117	108	116	101	81	72	77
	39	30	30	392	213	120	104	116	101	81	72	71
	41	27	27	281	.....	120	276	114	101	81	72	71
	39	32	32	247	.....	116	221	126	101	78	70	66
	41	.....	37	217	.....	108	.....	126	.....	78	70	.....

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Monthly discharge of Santa Ana River and Pacific Light & Power Corporation's ca including Greenspot pipe line, near Mentone, Cal., for the year ending Sept. 30, 191

Month.	Discharge in second-feet.			Run-o (total acre-fe
	Maximum.	Minimum.	Mean.	
October	61	39	53.8	3
November	105	18	33.5	1
December	37	26	28.8	1
January	1,060	27	170	10
February	2,240	66	275	15
March	200	108	139	8
April	276	103	125	7
May	187	114	142	8
June	136	101	115	6
July	102	78	87.3	5
August	79	69	71.1	4
September	77	56	63.8	3
The year	2,240	18	108	78

PACIFIC LIGHT & POWER CORPORATION'S CANAL[1] AND GREENSPOT PIPE LI NEAR MENTONE, CAL.

LOCATION.—At tailrace of Pacific Light & Power Corporation's plant at mouth canyon, about 3 miles northeast of Mentone.

RECORDS AVAILABLE.—1896 to September 30, 1914.

GAGE.—Hook gage at weir about 300 feet west of power house.

DISCHARGE.—Computed from gage heights which give head on 10-foot rectangul weir.

DIVERSIONS.—The Greenspot pipe line diverts from the forebay; record of this wat must be added to give total flow of canal. The pipe line was put in operati September 7, 1911.

ACCURACY.—Results good.

Daily discharge, in second-feet, of Pacific Light & Power Corporation's canal near Me tone, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sep
1	51	29	27	32	72	77	74	72	72	76	72	
2	56	27	27	29	72	77	74	74	72	76	66	
3	54	24	24	29	74	77	74	74	73	76	66	
4	56	19	27	27	74	77	74	74	73	76	66	
5	56	19	24	29	72	77	74	74	73	76	66	
6	56	19	24	27	70	77	74	74	73	74	66	
7	56	19	24	27	70	77	74	74	73	74	66	
8	54	19	24	27	64	77	74	74	73	74	66	
9	56	19	24	27	64	77	74	74	78	74	66	
10	54	16	24	24	64	74	74	74	78	74	64	
11	54	22	24	27	60	74	74	74	78	74	62	
12	54	19	24	24	58	74	74	74	78	73	62	
13	51	73	27	24	58	74	74	74	78	73	62	
14	46	34	27	24	56	74	74	74	78	73	62	
15	51	27	24	77	58	74	74	74	78	73	62	
16	49	29	24	77	58	74	74	72	78	73	62	
17	51	27	24	77	58	74	72	72	78	73	62	
18	54	27	24	70	60	74	72	72	78	73	62	
19	54	71	24	77	74	74	72	72	78	73	62	
20	58	46	24	72	41	74	72	72	78	71	62	
21	54	34	24	77	51	74	72	72	78	71	62	
22	54	32	24	70	37	74	74	72	78	71	62	
23	51	27	32	64	37	74	74	72	76	71	62	
24	46	29	27	58	51	74	73	72	76	71	64	
25	49	27	27	77	77	74	73	72	76	71	64	
26	41	27	32	41	77	74	73	72	76	71	64	
27	41	27	29	70	77	74	73	72	76	71	64	
28	37	27	27	77	77	74	73	72	76	71	64	
29	39	24	24	77	.....	74	73	72	76	71	64	
30	37	29	29	77	.....	74	72	72	76	71	64	
31	39	.....	34	77	.....	74	.....	72	.....	71	64	...

[1] Formerly known as Mentone Power Co.'s canal.

NOTE.—Discharge May 12 and 13 interpolated.

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ly discharge of Pacific Light & Power Corporation's canal near Mentone, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
r	58	37	50.3	3,090
ber	73	16	28.9	1,720
ber	34	24	25.9	1,590
y	77	24	51.4	3,160
ry	77	37	62.9	3,490
	77	74	74.9	4,610
	74	72	73.4	4,370
	74	72	72.9	4,480
	78	72	76.1	4,530
	76	71	72.9	4,480
	72	62	63.9	3,930
ıber	70	50	57.6	3,430
The year	78	16	59.2	42,900

discharge, in second-feet, of Greenspot pipe line near Mentone, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
	1.5	1.4	2.5	2.0	2.0	4.0	6.0	7.0	5.5	7.6	5.0	4.0
	1.5	1.4	2.5	2.0	2.0	4.0	6.0	3.6	5.5	7.6	5.0	4.0
	2.5	1.4	2.5	2.0	2.0	4.0	6.0	3.6	5.5	7.6	5.0	4.0
	2.5	2.9	2.5	2.0	2.0	4.0	6.0	3.6	5.5	7.6	5.0	4.0
	4.5	2.9	2.5	2.0	5.7	4.0	6.0	3.6	5.5	7.6	5.0	4.0
	4.5	2.9	2.5	2.0	5.7	4.0	6.0	3.6	5.5	7.6	5.0	4.0
	4.5	2.5	2.5	2.0	5.0	4.0	6.0	3.6	5.5	7.6	5.0	4.0
	4.5	2.5	2.5	2.0	5.0	4.0	6.0	3.6	5.5	7.6	5.0	4.0
	4.5	2.5	2.5	2.0	5.0	4.0	6.0	3.6	5.5	7.6	5.0	4.0
	4.5	1.2	2.5	2.0	5.0	6.0	6.0	3.6	5.5	7.6	5.0	4.0
	4.5	1.2	2.5	2.0	6.0	6.0	6.0	3.6	5.5	7.6	5.0	3.0
	4.5	1.2	2.5	2.0	6.0	6.0	6.0	3.6	5.5	7.6	5.0	3.0
	2.0	1.2	1.5	2.0	6.0	6.0	6.0	3.6	5.5	7.6	5.0	6.0
	2.0	1.2	1.5	2.0	6.0	6.0	6.0	3.6	6.0	7.6	5.0	6.0
	4.5	1.2	1.5	2.0	6.0	6.0	6.0	3.6	6.0	7.6	5.0	6.0
	4.5	1.2	1.5	2.0	6.0	6.0	6.0	3.6	6.0	7.6	6.5	6.0
	4.5	1.2	1.5	2.5	6.0	6.0	6.0	5.5	6.0	7.6	6.5	6.0
	4.5	2.5	2.0	2.5	6.0	6.0	6.0	5.5	6.0	7.6	6.5	6.0
	2.5	2.5	2.0	2.5	6.0	6.0	6.0	5.5	6.0	7.6	5.0	6.0
	.5	2.5	2.0	2.5	6.0	6.0	7.0	5.5	6.0	7.6	5.0	5.0
	.5	2.5	2.0	2.5	4.0	6.0	7.0	5.5	6.0	7.6	5.0	5.0
	3.0	2.5	2.0	2.5	4.0	6.0	7.0	5.5	6.0	7.6	5.0	5.0
	3.0	2.5	2.0	2.5	4.0	6.0	7.0	5.5	6.0	7.6	5.0	5.0
	3.0	2.5	2.0	2.5	1.0	6.0	7.0	5.5	7.0	7.6	5.0	6.0
	2.0	2.5	2.0	2.5	4.0	6.0	7.0	5.5	7.0	7.6	5.0	6.0
	2.0	2.5	2.0	2.5	4.0	6.0	7.0	5.5	7.0	7.6	6.5	6.0
	2.0	2.5	2.0	.0	4.0	6.0	7.0	5.5	7.0	7.6	6.5	6.0
	1.4	2.5	2.0	.0	4.0	6.0	7.0	5.5	7.0	7.6	6.5	6.0
	1.4	2.5	2.0	.0	.....	6.0	3.2	5.5	7.0	7.6	6.5	6.0
	1.4	2.5	2.0	.0	.....	6.0	7.0	5.5	7.0	5.0	4.0	6.0
	1.4	.....	2.0	2.0	.....	6.0	.....	5.5	.....	5.0	4.0	.....

hly discharge of Greenspot pipe line near Mentone, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
ar	4.5	0.5	2.91	179
nber	2.9	1.2	2.08	124
ıber	2.5	1.5	2.11	130
ry	2.5	.0	1.90	117
ary	6.0	1.0	4.59	255
	6.0	4.0	5.42	333
	7.0	3.2	6.24	371
	7.0	3.6	4.63	285
	7.0	5.5	6.02	358
	7.6	5.0	7.43	457
t	6.5	4.0	5.27	324
nber	6.0	3.0	5.00	298
The year	7.6	.0	4.46	3,230

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MILL CREEK AT FOREST HOME,[a] CAL.

LOCATION.—In the NW. ¼ NE. ¼ sec. 13, T. 1 S., R. 1 W., at Forest Home, about 2½ miles below Falls Creek, 4 miles above Mountain Home Creek, and 14 miles east of Redlands.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 23, 1903, to September 30, 1914.

DISCHARGE.—Obtained by combining flow in power canal with flow over diverting dam. Current-meter measurements are made of canal. The record of flow over diverting dam is approximate and no report is made when total discharge exceeds 100 second-feet.

EXTREMES OF DISCHARGE.—Maximum mean daily discharge 1903–1914, 368 second-feet February 20, 1914; minimum mean daily discharge, 7 second-feet November 19 and 20, 1904.

ACCURACY.—Daily discharge is mean of two observations recorded each day at 6 a. m. and 6. p. m. When total flow of Mill Creek is diverted into power canal results are good; at higher stages they are approximate.

COOPERATION.—Estimates of daily discharge furnished by Southern California Edison Co., through H. W. Dennis, construction engineer.

Daily discharge, in second-feet, of Mill Creek at Forest Home, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	10	9.6	9.5	10.5	22	46	45	44	58	36	28	22
2	10	11	9.4	9.6	22	48	45	44	58	36	28	22
3	10	10	9.4	9.6	22	50	45	54	58	37	28	22
4	10	9.6	9.4	9.4	22	50	45	55	55	37	27	22
5	10	9.6	9.4	9.4	22	50	46	55	52	37	28	21
6	10	9.6	9.4	9.4	21	52	46	55	52	35	27	21
7	10	9.5	9.4	9.3	21	55	45	52	50	35	27	21
8	10	9.5	9.4	9.3	21	55	45	52	50	34	27	21
9	10	9.5	9.2	9.2	21	55	45	52	50	34	27	21
10	10	9.2	9.2	9.2	21	55	45	52	48	34	27	21
11	10	9.5	9.2	9.2	21	55	46	52	45	33	27	20
12	10	9.5	9.2	9.2	22	55	48	55	45	33	26	20
13	10	12	9.2	9.2	23	55	48	56	44	32	26	20
14	10	9.8	9.2	9.3	23	55	48	58	42	32	26	20
15	9.9	9.7	9.2	86	23	55	49	58	40	33	26	20
16	9.8	9.6	9.2	46	23	55	52	58	40	33	26	19.6
17	9.8	9.6	9.2	18.3	23	55	52	58	40	33	26	19.5
18	9.7	9.3	9.2	17.5	26	55	52	58	40	31	26	19.4
19	9.7	11	9.2	15.3	36	52	52	58	40	31	25	19.0
20	9.7	10	9.2	12.8	368	50	52	58	40	30	25	18.8
21	9.6	10	9.1	12.9	152	50	52	58	39	30	25	18.6
22	9.6	10	10	[b] 12.6	50	50	50	58	37	30	25	18.1
23	9.6	9.9	9.5	12.1	49	50	50	58	36	29	24	17.8
24	9.6	9.6	9.4	13.1	48	50	50	58	38	28	24	17.8
25	9.6	9.4	9.6	21	47	48	50	58	38	29	23	17.9
26	9.6	9.6	9.5	34	46	45	[b] 50	58	37	29	22	18.0
27	9.6	9.4	9.4	24	46	45	50	58	37	29	22	18.0
28	9.6	9.4	9.4	21	46	45	50	58	37	29	22	22
29	9.6	9.4	9.4	19.6	.....	45	42	58	37	29	22	19.4
30	9.6	9.4	14	21	.....	45	44	58	36	28	22	18.5
31	9.6	.....	18	21	.....	44	.....	54	.....	28	22	.....

[a] Akers Camp on map of San Gorgonio quadrangle, U. S. Geological Survey.
[b] From morning readings only.

NOTE.—Daily discharge Dec. 16 interpolated by engineers of U. S. Geological Survey.

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Monthly discharge of Mill Creek at Forest Home, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	10	9.6	9.81	603
November	12	9.2	9.77	581
December	18	9.1	9.77	601
January	86	9.2	17.4	1,070
February	368	21	46.0	2,560
March	55	44	50.8	3,120
April	52	42	48.0	2,860
May	58	44	55.4	3,410
June	58	36	44.0	2,620
July	37	28	32.1	1,970
August	28	22	25.4	1,560
September	22	17.8	19.9	1,180
The year	368	9.1	30.6	22,100

NOTE.—Monthly and yearly discharge computed by engineers of U. S. Geological Survey.

WATERMAN CANYON CREEK NEAR SAN BERNARDINO, CAL.

LOCATION.—In the SW. ¼ SW. ¼ sec. 2, T. 1 N., R. 4 W., just above old toll bridge at mouth of canyon, about 6 miles north of San Bernardino.

DRAINAGE AREA.—4.55 square miles.

RECORDS AVAILABLE.—November 2, 1911, to October 30, 1914, when station was discontinued.

GAGE.—Vertical staff fastened to an alder tree on left bank about 300 feet above bridge. Observer, H. E. Mastin.

DISCHARGE MEASUREMENTS.—Made from foot plank 15 feet below gage or by wading.

CHANNEL AND CONTROL.—Boulders and gravel; shifts during high water.

EXTREMES OF DISCHARGE.—Maximum stage and discharge during year unknown; minimum stage recorded, 1.60 feet at 5.30 p. m. October 24 (discharge, 0.2 second-foot).

1912–1914: Maximum stage occurred during January or February, 1914; stage and discharge unknown; no flow September 15 to 17, 1913.

ACCURACY.—Rating curves well defined except for high stages; discharge for days on which gage was not read estimated by comparison with record of Devil Canyon Creek.

Discharge measurements of Waterman Canyon Creek near San Bernardino, Cal., during the years ending Sept. 30, 1914–1915.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
1913-14.		*Feet.*	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 6	F. C. Ebert	1.63	0.3	Apr. 30	F. C. Ebert	2.02	14
8	do	1.72	.5	May 1	do	2.00	13
Jan. 13	do	1.82	1.1	8	do	1.86	8.4
14	do	1.81	1.2	16	do	1.83	8.3
16	do	2.26	11	June 26	do	1.62	3.4
16	do	2.21	9.5	Aug. 13	do	1.52	1.8
Feb. 6	do	1.93	10	Sept. 21	do	1.48	1.2
27	do	2.25	27				
Mar. 11	do	2.02	14	1914-15.			
29	H. D. McGlashan	1.89	9.5	Apr. 14	F. C. Ebert	2.03	5.4
Apr. 16	F. C. Ebert	1.75	7.6				

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Daily discharge, in second-feet, of Waterman Canyon Creek near San Bernardino, Cal., for the period Oct. 1, 1913, to Oct. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	0.8	0.6	1.4	2.7	20	30	9	12	6	4.2	3.5	2.0	1.7
2	1.0	2.9	1.2	2.4	15	28	9	10	7	4.6	2.1	2.3	.7
3	1.2	1.1	1.2	2.1	14	23	8	12	6.5	3.1	3.3	2.1	3.5
4	.4	1.2	1.3	3.6	13	22	8.5	10	6	3.5	2.9	1.7	2.8
5	.3	.8	1.5	1.9	12	23	11	9.5	7	3.9	2.1	1.3	3.1
6	1.1	.5	1.3	2.0	11	24	10	9	6.5	3.9	2.3	1.3	2.5
7	1.2	.8	1.3	1.9	10	25	10	9	9	3.5	3.1	1.8	2.8
8	.5	.8	1.5	1.8	10	19	9	9	8.5	3.5	1.5	2.0	2.8
9	2.0	.6	1.1	1.9	9	17	8.5	7.5	9	2.9	1.7	1.8	1.8
10	.3	.5	1.5	1.9	8.5	17	9.5	7.5	6	3.3	2.1	.8	2.1
11	.4	.8	1.5	2.0	8	17	9.5	8	6	3.3	1.5	1.5	2.3
12	.3	2.2	1.6	1.9	8	13	9	7.5	6.5	3.1	1.3	1.7	1.8
13	.4	2.0	1.6	1.2	6.5	14	8	7	5.5	3.9	1.3	1.3	1.3
14	1.2	1.4	1.8	1.1	7.5	12	8	8	5.5	4.6	2.3	.8	1.2
15	.3	1.2	1.6	12	7	12	7.5	7.5	5	3.1	1.8	2.0	1.3
16	.3	1.5	1.8	5.5	7	11	7.5	8.5	5.5	3.5	2.3	2.1	1.4
17	.2	1.4	1.6	7.5	7.5	10	7.5	7	6	3.9	1.3	1.7	2.6
18	.2	1.2	1.9	54	12	9.5	7	7	5.5	2.9	2.3	2.3	1.1
19	.6	4.8	2.0	34	15	11	7.5	7.5	5.5	3.5	.8	2.5	2.8
20	.5	3.4	1.9	24	125	10	6.5	6.5	6	2.9	1.7	1.3	2.9
21	.7	2.2	2.0	18	175	10	9	6.5	5	3.3	2.1	2.1	4.4
22	.3	1.9	4.4	17	100	9.5	8	7	5	4.4	3.7	2.3	2.8
23	.3	1.6	3.0	15	60	9.5	10	7	5.5	4.0	1.2	2.1	2.9
24	.2	1.3	2.9	17	45	9.5	7.5	7	4.6	3.5	2.1	1.3	3.1
25	.6	1.6	3.0	46	37	9	8	7	5	3.1	1.2	1.2	2.8
26	.5	1.6	2.5	150	92	9.5	7	7	3.5	2.6	.9	1.8	2.6
27	.3	1.4	2.9	75	25	9.5	7.5	7	3.1	3.9	2.3	1.6	2.0
28	.4	1.0	2.2	40	30	11	28	7.5	3.9	2.8	2.1	1.3	1.8
29	.5	1.2	2.2	30	.....	9.5	38	7	4.6	3.3	1.3	2.1	2.8
30	.8	1.3	3.4	25	.....	11	13	6	4.4	3.5	2.3	2.0	3.1
31	.5	.....	3.6	20	.....	9.5	.....	6	.....	3.5	1.8	.....	.....

Monthly discharge of Waterman Canyon Creek near San Bernardino, Cal., for the years ending Sept. 30, 1914–1915.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1913–14.					
October	2.0	0.2	0.59	36	
November	4.8	.5	1.49	89	C.
December	4.4	1.1	2.02	124	C.
January	150	1.1	19.9	1,220	C.
February	175	6.5	31.8	1,770	C.
March	30	9	14.7	904	B.
April	38	6.5	10.2	607	C.
May	12	6	7.90	486	B.
June	9	3.1	5.77	343	B.
July	4.6	2.6	3.52	216	B.
August	3.7	.8	2.01	124	C.
September	2.5	.8	1.74	104	C.
The year	175	0.2	8.32	6,020	
1914.					
October 1 to 30	4.4	0.7	2.36	140	C.

DEVIL CANYON CREEK NEAR SAN BERNARDINO, CAL.

LOCATION.—In the SE. ¼ NE. ¼ sec. 6, T. 1 N., R. 4 W., in Angeles National Forest, at mouth of canyon, about 200 feet below ford, and about 7 miles northwest of San Bernardino.

DRAINAGE AREA.—6.16 square miles.

RECORDS AVAILABLE.—November 1, 1911, to September 30, 1912, and October 1, 1913, to September 30, 1914, when station was discontinued. Miscellaneous measurements in year ending September 30, 1913.

GAGE.—Vertical staff fastened to alder tree on left bank about 200 feet below ford; weir gage is a vertical staff in pool directly above weir. Observers, Joseph Hayden, O. H. McElfresh, O. Chandler, and J. H. Hayden.

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DISCHARGE MEASUREMENTS.—Made from foot plank about 100 feet below gage or by wading.

CHANNEL AND CONTROL.—Boulders and gravel; somewhat shifting during high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.31 feet at 8 a. m. January 26 (discharge, computed from extension of rating curve, 204 second-feet); minimum stage recorded, discharge over weir, 0.2 second-foot, October 3, 4, 9 to 11, and 16 to 20.

1912–1914: Maximum stage recorded, 4.31 feet at 8 a. m. January 26, 1914 (discharge, computed from extension of rating curve, 204 second-feet); minimum stage recorded, 1.28 feet August 21 and 22, 1912 (discharge, 0.08 second-foot).

ACCURACY.—Discharge estimated for days on which gage was not read by comparison with record of Waterman Canyon Creek. October 1, 1913, to January 24, 1914, record is from a 30-inch Cippoletti weir installed about 500 feet above gage at intake of small irrigation ditch. Occasionally a small amount of water is diverted into this ditch. The flow is measured over a 30-inch Cippoletti weir on left bank in same pool as creek weir. Discharge of canal is combined with discharge of creek to give total run-off from drainage basin; results good.

COOPERATION.—Gage-height record furnished by United States Forest Service.

Discharge measurements of Devil Canyon Creek near San Bernardino, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 8	F. C. Ebert	1.33	[a] 0.2	Apr. 16	F. C. Ebert	1.68	6.3
Jan. 13	do	1.59	[a] 1.6	May 1	do	1.88	12
16	do	1.97	[a] 8.9	8	do	1.77	7.5
16	do	1.81	[a] 5.2	16	do	1.75	7.1
Feb. 6	do	1.74	7.8	June 26	do	1.58	3.6
27	do	2.20	25	Aug. 13	do	1.50	2.1
Mar. 11	do	1.86	12	Sept. 21	do	1.40	1.0
29	H. D. McGlashan	1.79	9.6				

[a] Measured by weir.

Daily discharge, in second-feet, of Devil Canyon Creek near San Bernardino, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.5	0.5	1.7	2.3	14	21	10	16	6	3	1.0	0.7
2	.4	1.5	1.7	2.1	12	17	10	16	6	3	1.0	.7
3	.2	1.4	1.7	2.1	10	17	10	14	6	3	1.0	.7
4	.2	.7	1.7	2.0	8.5	17	10	14	6	3	.7	.7
5	.3	.75	1.7	1.9	8.5	15	10	12	7.5	2	.7	.7
6	.35	.65	1.6	1.7	8.5	15	10	10	7.5	2	1.0	.7
7	.35	.65	1.6	1.7	8	15	10	12	8.5	2	1.0	.7
8	.25	.6	1.6	1.7	7	14	8.5	8.5	8.5	2	1.0	.7
9	.2	.5	1.6	1.7	7	14	8.5	10	6	2	.7	.7
10	.2	.45	1.5	1.7	7	14	10	8.5	7.5	2	.7	.7
11	.2	.6	1.5	1.7	7	12	10	8.5	6	1.5	.7	.7
12	.35	1.0	1.5	1.7	7	10	8.5	8.5	5	1.5	.7	.7
13	.35	3.9	1.4	1.7	7	10	8.5	8.5	5	1.5	1.0	1.0
14	.25	1.5	1.4	1.7	7	10	8.5	12	5	2	.7	.7
15	.3	1.5	1.4	9.5	7	10	7	10	5	1.5	.7	.7
16	.2	1.5	1.4	11.0	7	10	7	10	5	1.5	.7	.7
17	.2	1.5	1.4	9.0	7	10	7	8.5	4	1.5	.4	.7
18	.2	1.5	1.4	50	7	9	7	7.5	4	1.5	.4	.7
19	.2	5.0	1.4	30	10	8.5	6	8.5	4	2	.7	.7
20	.2	3.5	1.4	11.0	98	10	6	7.5	4	2	.4	.7
21	.35	2.0	1.5	7.0	164	10	7	7.5	4	2	.4	1.0
22	.4	1.8	2.3	6.0	90	10	8.5	8.5	3	1.5	.7	1.0
23	.45	2.0	1.4	5.5	56	10	8.5	7.5	3	1	.7	1.0
24	.5	1.5	2.3	6.5	38	10	8.5	10	3	1	.7	1.0
25	.55	1.5	2.1	29	30	10	8.5	8.5	3	1	.7	1.0
26	.55	1.5	2.5	147	28	10	7	8.5	3	1	.7	1.0
27	.5	1.5	3.0	66	25	10	7	8.5	3	1.5	1.0	1.0
28	.5	1.5	2.0	30	25	12	8.5	7.5	3	1.5	1.0	1.0
29	.5	1.5	2.0	25	.....	12	19	6	3	1	.7	1.0
30	.5	1.5	2.5	21	.....	10	16	6	3	.7	1.0	1.0
31	.5	.....	2.5	15	.....	10	.....	5	.....	.7	1.0	.....

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Monthly discharge of Devil Canyon Creek near San Bernardino, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0.55	0.2	0.34	21	
November	5.0	.45	1.52	90	
December	3.0	1.4	1.76	108	
January	147	1.7	16.3	1,000	
February	164	7.0	25.4	1,410	C.
March	21	8.5	12.0	738	B.
April	19	6.0	9.03	537	B.
May	16	5.0	9.48	583	B.
June	8.5	3.0	4.92	293	B.
July	3.0	.7	1.72	106	C.
August	1.0	.4	.77	47	
September	1.0	.7	.81	48	
The year	164	0.2	6.81	4,980	

LYTLE CREEK NEAR SAN BERNARDINO, CAL.

LOCATION.—In the NW. ¼ sec. 25, T. 2 N., R. 6 W., at Southern California Edison Co.'s diversion dam, below junction of North and Middle forks of Lytle Creek, about 3 miles above mouth of canyon and 14 miles northwest of San Bernardino.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 18, 1904, to September 30, 1914.

GAGE.—Watson water-stage recorder in pool above weir in power canal.

DISCHARGE.—Computed by combining flow in power canal with flow over diverting dam; discharge of power canal is measured near intake by an 8-foot steel plate rectangular weir; flow over diverting dam is estimated.

EXTREMES OF DISCHARGE.—Maximum mean daily discharge 1904–1914, 1,260 second-feet January 18, 1914; minimum, 5.1 second-feet September 30 and October 3, 1904.

ACCURACY.—Daily discharge is mean of two observations recorded each day at 6 a. m. and 6 p. m. When total flow of Lytle Creek is diverted into power canal results are good; above 23 second-feet (capacity of canal) they are approximate.

COOPERATION.—Estimates of daily discharge furnished by Southern California Edison Co., through H. W. Dennis, construction engineer.

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Daily discharge, in second-feet, of Lytle Creek near San Bernardino, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	9.1	9.4	15.8	14.4	83	423	73	40	53	43	48	48
2	9.1	10.6	15.2	14.2	83	403	73	40	53	43	48	48
3	9.4	9.9	15.2	14.0	83	333	73	40	53	43	48	47
4	9.4	9.6	15.4	14.0	83	373	73	40	53	43	48	47
5	9.3	9.4	15.4	14.0	83	298	73	40	53	43	48	46
6	9.4	9.5	15.7	14.2	83	223	73	40	53	44	48	46
7	9.1	9.6	15.3	14.2	83	183	73	63	53	45	49	46
8	8.8	9.8	15.3	14.4	83	163	73	63	53	45	48	45
9	9.0	9.5	15.0	14.5	73	142	73	63	53	46	48	44
10	9.0	9.5	14.7	14.2	63	142	73	63	53	46	48	44
11	9.0	10.5	14.4	14.2	63	123	50	63	53	47	48	44
12	8.8	11.7	14.4	14.0	62	112	50	63	53	46	48	44
13	9.1	13.4	14.4	13.9	57	103	50	63	53	46	48	44
14	9.0	12.0	14.4	13.8	53	109	45	63	53	47	49	44
15	9.1	11.7	14.4	33	53	103	40	63	53	49	48	43
16	9.2	11.4	14.2	42	53	103	40	63	53	49	48	42
17	9.1	11.4	14.1	28	53	98	40	63	53	49	48	42
18	9.0	11.1	13.9	1,260	626	93	40	63	53	49	48	42
19	9.0	26	13.9	264	373	93	40	63	50	49	48	42
20	9.0	21	13.9	52	.....	93	40	57	47	49	48	41
21	9.0	18.4	13.8	52	400	92	40	58	47	49	48	40
22	9.2	17.7	18.6	52	1,200	92	40	58	47	49	48	40
23	9.2	17.3	15.4	48	800	92	40	58	47	48	48	40
24	9.0	17.2	14.6	53	400	87	40	58	47	48	48	40
25	9.0	16.6	15.8	113	300	82	40	58	47	48	48	39
26	9.4	16.3	14.8	.....	300	82	40	55	47	48	48	38
27	9.5	15.4	14.8	432	300	82	40	53	47	48	48	38
28	9.4	16.2	14.4	173	300	82	40	53	45	48	48	38
29	9.4	16.0	14.2	103	.....	83	40	53	43	48	48	38
30	9.6	16.3	14.2	83	.....	82	40	53	43	49	48	37
31	9.5	.....	14.4	83	.....	72	.....	53	.....	48	48	.....

NOTE.—Discharge Nov. 4, Dec. 10, and Mar. 5 interpolated. Floods of Jan. 26 and Feb. 20 extremely severe; no record obtained.

Monthly discharge of Lytle Creek near San Bernardino, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	9.6	8.8	9.16	563
November	26	9.4	13.5	803
December	18.6	13.8	14.8	910
March	423	72	150	9,220
April	73	40	52.2	3,110
May	63	40	55.7	3,420
June	53	43	50.4	3,000
July	49	43	46.8	2,880
August	49	48	48.1	2,960
September	48	37	42.6	2,530

NOTE.—Monthly discharge computed by engineers of U. S. Geological Survey.

SAN ANTONIO CREEK NEAR UPLAND, CAL.

LOCATION.—In SW. ¼ sec. 36, T. 2 N., R. 8 W., below Pacific Light & Power Corporation's power house, about 4 miles above mouth of canyon and 8 miles northwest of Upland.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—March 11, 1901, to September 30, 1914.

DISCHARGE.—Determined from gage-height record obtained at 10-foot rectangular weir in tailrace; excess water flowing over diverting dam is estimated.

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EXTREMES OF DISCHARGE.—1901–1914: Maximum mean daily discharge, 607 second-feet February 21, 1914; minimum, 3.4 second-feet February 29, 1904.

ACCURACY.—The capacity of power canal is about 21 second-feet. When flow of stream does not exceed this amount the results are excellent.

COOPERATION.—Daily discharge estimates furnished by Pacific Light & Power Corporation, through H. A. Barre, chief engineer.

Daily discharge, in second-feet, of San Antonio Creek near Upland, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	6.7	6.2	6.6	6.6	39	199	36	35	32	27	23	17.5
2	6.7	6.0	6.6	6.5	37	179	36	35	32	26	23	17.0
3	6.7	6.6	6.6	6.5	35	159	36	35	32	26	22	16.5
4	6.7	6.2	6.6	6.5	35	139	36	35	32	26	22	16.5
5	6.7	6.6	6.6	6.5	34	119	36	35	32	26	22	15.6
6	6.7	6.6	6.5	6.5	33	109	35	35	32	26	21	15.6
7	6.7	6.2	6.5	6.5	32	99	35	35	32	26	21	15.6
8	6.7	6.0	6.5	6.5	31	89	35	35	32	26	20	15.6
9	6.7	6.2	6.5	6.5	30	79	34	34	32	26	20	15.5
10	6.7	6.2	6.5	6.5	30	69	34	34	32	26	20	15.5
11	6.6	6.2	6.5	6.6	30	59	34	34	31	26	20	15.5
12	6.6	6.8	6.5	6.5	30	55	33	34	31	26	20	15.5
13	6.7	6.6	6.5	6.5	30	49	39	34	31	26	19.1	15.1
14	6.7	6.6	6.5	6.6	29	43	33	34	31	26	19.1	15.3
15	6.6	6.5	6.5	9.4	27	43	33	34	31	26	18.6	15.5
16	6.6	6.3	6.5	9.4	27	43	33	34	31	26	18.6	15.5
17	6.6	6.3	6.5	8.8	27	43	33	33	30	26	18.6	15.3
18	6.2	6.3	6.5	21	27	43	33	33	30	26	18.6	15.3
19	6.6	7.7	6.5	14	47	43	33	33	29	26	18.6	15.1
20	6.6	7.0	6.5	9.9	507	41	33	33	29	25	18.6	15.1
21	6.0	6.6	6.5	11.6	607	41	33	33	29	25	18.3	15.1
22	6.6	6.6	6.5	13.2	567	41	33	33	28	25	18.3	15.1
23	6.6	6.6	6.5	13.8	527	41	33	33	28	25	18.3	14.7
24	6.6	6.6	6.5	21	487	41	33	33	28	25	18.3	14.7
25	6.0	6.5	6.5	25	427	39	33	33	28	25	18.3	14.7
26	6.0	6.6	6.5	108	387	39	33	33	28	25	18.3	14.7
27	6.6	6.6	6.5	58	339	36	33	33	27	24	18.3	14.5
28	7.0	6.6	6.5	51	258	37	33	33	27	24	18.0	14.5
29	6.6	6.6	6.5	51	.....	37	33	33	27	24	18.0	14.5
30	6.0	6.6	6.5	51	.....	37	35	33	27	24	17.7	13.9
31	6.0	.....	6.5	43	.....	36	.....	33	.....	23	17.7	.....

Monthly discharge of San Antonio Creek near Upland, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	7.0	6.0	6.54	402
November	7.7	6.0	6.50	387
December	6.6	6.5	6.52	401
January	108	6.5	19.7	1,210
February	607	27	168	9,330
March	199	36	68.6	4,220
April	39	33	34.1	2,030
May	35	33	33.8	2,080
June	32	27	30.0	1,790
July	27	23	25.5	1,570
August	23	17.7	19.5	1,200
September	17.5	13.9	15.4	916
The year	607	6.0	35.3	25,500

NOTE.—Monthly and yearly discharge computed by engineers of the U. S. Geological Survey.

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SAN GABRIEL RIVER BASIN.

SAN GABRIEL RIVER AT HEADWORKS NEAR AZUSA, CAL.

LOCATION.—In the SE. ¼ sec. 31, T. 2 N., R. 9 W., at ford 500 feet above intake of Pacific Light & Power Corporation's canal, and about 6 miles northeast of Azusa.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—December 9, 1912, to February 20, 1914, when station was discontinued.

GAGE. Vertical staff bolted to granite cliff on right bank just above ford. This gage was destroyed by flood February, 1914.

DISCHARGE MEASUREMENTS.—Made from cable at gage or by wading.

CHANNEL AND CONTROL.—Gravel and boulders; shifts during high water.

EXTREMES OF DISCHARGE.—Maximum stage during year and period 1912–14, 15.0 feet, estimated by observer, February 20 (discharge unknown); minimum stage recorded, 4.95 feet October 1, 2, 18 to 21, 26, and 27 (discharge, 14 second-feet).

ACCURACY.—No discharge measurements made after flood of January, 1914, which caused considerable change in the channel; discharge for low and medium stages, to January 14, 1914, determined from previous rating curve.

COOPERATION.—Station maintained in cooperation with Pacific Light & Power Corporation.

The following discharge measurement was made by F. C. Ebert:

January 12, 1914: Gage height, 5.15 feet; discharge, 39 second-feet.

Daily gage height, in feet, of San Gabriel River at headworks near Azusa, Cal., for the year ending Sept. 30, 1914.

[C. H. Paul, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Day.	Oct.	Nov.	Dec.	Jan.	Feb.
1	4.95	5.0	5.15	5.2	6.75	16	5.0	5.15	5.1	6.65	6.45
2	4.95	5.05	5.15	5.2	6.65	17	5.0	5.15	5.1	6.0	6.4
3	5.0	5.0	5.15	5.2	6.55	18	4.95	5.2	5.1	8.25	7.4
4	5.0	5.0	5.15	5.2	6.45	19	4.95	5.8	5.1	6.9	9.85
5	5.0	5.0	5.15	5.2	6.4	20	4.95	5.4	5.1	6.4	15.0
6	5.0	5.0	5.15	5.2	6.35	21	4.95	5.3	5.1	6.2	.....
7	5.0	5.0	5.15	5.15	6.35	22	5.0	5.25	5.2	6.0	.....
8	5.0	5.0	5.15	5.15	6.3	23	5.0	5.25	5.3	5.9	.....
9	5.0	5.0	5.1	5.15	6.45	24	5.0	5.2	5.2	5.95	.....
10	5.0	5.0	5.1	5.15	6.6	25	5.0	5.2	5.2	7.5	.....
11	5.0	5.0	5.1	5.15	6.6	26	4.95	5.2	5.2	14.0	.....
12	5.0	5.05	5.1	5.15	6.55	27	4.95	5.2	5.2	9.1	.....
13	5.0	5.55	5.1	5.15	6.55	28	5.0	5.15	5.2	7.5	.....
14	5.0	5.35	5.1	5.25	6.5	29	5.0	5.15	5.2	7.2	.....
15	5.0	5.2	5.1	5.95	6.5	30	5.0	5.15	5.2	7.05	.....
						31	5.0	.....	5.2	6.9	.....

Daily discharge, in second-feet, of San Gabriel River at headworks near Azusa, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Day.	Oct.	Nov.	Dec.	Jan.
1	14	18	37	44	16	18	37	30	.....
2	14	24	37	44	17	18	37	30	.....
3	18	18	37	44	18	14	44	30	.....
4	18	18	37	44	19	14	177	30	.....
5	18	18	37	44	20	14	78	30	.....
6	18	18	37	44	21	14	60	30	.....
7	18	18	37	37	22	18	52	44	.....
8	18	18	37	37	23	18	52	60	.....
9	18	18	30	37	24	18	44	44	.....
10	18	18	30	37	25	18	44	44	.....
11	18	18	30	37	26	14	44	44	.....
12	18	24	30	37	27	14	44	44	.....
13	18	110	30	37	28	18	37	44	.....
14	18	69	30	52	29	18	37	44	.....
15	18	44	30	.....	30	18	37	44	.....
					31	18	.....	44	.....

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Monthly discharge of San Gabriel River at headworks near Azusa, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	18	14	17.0	1,040	B.
November	177	18	42.5	2,530	B.
December	60	30	36.8	2,260	B.
January 1–14	52	37	44.1	1,220	B.
The period				7,050	

SAN GABRIEL RIVER NEAR AZUSA, CAL.

LOCATION.—In the NW. ¼ sec. 23, T. 1 N., R. 10 W., about 1,000 feet above road crossing at mouth of canyon, about one-half mile above Pacific Light & Power Corporation's power house, and 2 miles north of Azusa.

DRAINAGE AREA.—222 square miles.

RECORDS AVAILABLE.—1894 to September 30, 1914.

GAGE.—Staff in two sections bolted to large boulders on left bank about 1,000 feet above site at mouth of canyon previously used; February 10–19, 1914, a temporary gage, fastened to the concrete wall on left bank about 500 feet below cable, was read. February 20 to June 10 the gage at the original section at the ford was read. At extreme low water, June 11 to July 31, a temporary vertical staff, at an independent datum, about 100 feet downstream, was used. Original datum has not been maintained. Observer, J. G. Woodward.

DISCHARGE MEASUREMENTS.—Made from cable about 50 feet below gage or by wading; equipment destroyed by the flood in February, 1914.

CHANNEL AND CONTROL.—Gravel and boulders; shifts during high water.

EXTREMES OF DISCHARGE.—Maximum stage during year and for period 1894–1914, 11.7 feet on morning of February 20 (determined by leveling from flood marks; approximate discharge, computed from extension of rating curve, 18,100 second-feet); channel dry nearly half the year.

DIVERSIONS.—The power canal of the Pacific Light & Power Corporation heads about 5 miles above the station. This water is not returned to the river. The upper gage is above the tunnels and temporary diversions for irrigation.

ACCURACY.—On account of the shifting of the channel and changes required in equipment, determinations of high-water discharge are approximate; otherwise record is good.

Discharge measurements of San Gabriel River near Azusa, Cal., during the year ending Sept. 30, 1914.

[Made by F. C. Ebert.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Jan. 12	.....	Dry.	May 7	[b] 4.89	221	July 13	[c] 1.02	12
Feb. 10	[a] 1.46	288	16	[b] 4.87	197	20	[c] .87	5.7
15	[a] 1.17	205	June 2	[b] 4.71	132	27	[c] .70	3.0
19	[b] 7.90	4,560	24	[c] 1.65	65	Aug. 3	.....	Dry.
Apr. 14	[b] 4.94	294	29	[c] 1.57	53			
30	[b] 4.93	277	July 6	[c] 1.20	19			

[a] Temporary gage installed Feb. 10, 1914.
[b] Old gage at original section at the ford.
[c] Temporary gage installed June 11, 1914.

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discharge, in second-feet, of San Gabriel River near Azusa, Cal., for the year ending Sept. 30, 1914.

Day.	Nov.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
.....	.....	.....	685	2,100	340	269	135	34
.....	.....	.....	685	1,910	340	261	132	30
.....	.....	.....	625	1,730	302	253	129	27
.....	.....	.....	625	1,560	302	245	125	24
.....	.....	.....	625	1,480	340	237	121	21
.....	.....	.....	598	1,480	302	229	117	21
.....	.....	.....	598	1,400	302	221	113	21
.....	.....	.....	545	1,250	302	219	109	15
.....	.....	.....	390	840	302	216	105	12
.....	.....	.....	285	730	302	213	101	12
.....	.....	.....	270	620	302	210	98	10
.....	.....	.....	240	620	302	208	83	10
.....	.....	.....	240	520	302	205	70	10
.....	.....	.....	240	472	294	202	70	10
.....	.....	230	225	425	293	200	70	10
.....	.....	850	215	425	292	197	64	8
.....	.....	300	255	425	291	194	64	8
.....	.....	5,050	1,720	472	290	190	64	6
.....	40	1,640	4,490	425	289	186	64	6
.....	4	750	11,800	425	287	182	64	6
.....	.....	470	8,480	425	286	178	64	6
.....	.....	425	6,620	425	285	174	58	5
.....	.....	380	4,710	425	284	170	58	4
.....	.....	380	4,180	382	283	166	58	3
.....	.....	3,160	2,950	382	282	163	52	2
.....	.....	9,150	2,840	382	281	159	52	2
.....	.....	2,460	2,500	382	280	155	52	2
.....	.....	1,880	2,200	340	279	151	52	2
.....	.....	985	.....	340	278	147	52	1
.....	.....	820	.....	425	277	143	37	1
.....	.....	820	.....	382	.....	139	.....	1

s.—Channel dry Oct. 1 to Nov. 18, Nov. 21 to Jan. 14, and Aug. 1 to Sept. 30; discharge Jan 26 esti-
Discharge Apr. 14 to June 10 determined by indirect method for shifting channels; discharge
4 interpolated.

ined daily discharge, in second-feet, of San Gabriel River and canal [1] near Azusa, Cal., for the year ending Sept. 30, 1914.

ay.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	13	17	36	44	685	2,100	340	339	215	114	80	51
.....	14	20	35	45	725	1,910	340	329	212	110	80	53
.....	14	18	34	44	677	1,730	342	321	209	107	70	50
.....	15	19	33	45	677	1,560	382	313	205	104	65	50
.....	17	19	33	44	677	1,480	420	317	201	101	65	48
.....	17	18	33	42	650	1,480	370	309	197	101	64	48
.....	16	18	33	41	650	1,400	368	301	193	101	64	48
.....	15	17	32	40	601	1,250	368	299	189	95	63	47
.....	15	17	31	40	450	882	370	296	185	92	63	48
.....	16	17	32	40	345	800	370	293	181	92	63	47
.....	16	17	32	39	330	693	370	290	178	90	62	46
.....	15	22	31	38	300	682	370	288	163	90	59	46
.....	15	69	31	38	300	588	370	285	150	90	59	47
.....	15	64	31	38	307	541	362	282	150	90	59	47
.....	15	46	31	290	280	495	361	280	150	90	59	48
.....	15	37	32	910	267	495	368	277	144	88	57	46
.....	15	33	31	360	282	495	359	274	144	88	57	44
.....	14	32	31	5,110	1,750	490	358	270	144	86	57	45
.....	14	116	31	1,700	4,540	425	357	266	144	86	57	45
.....	13	80	32	810	11,800	425	355	262	144	86	57	45
.....	14	66	32	530	8,480	425	354	258	144	86	57	45
.....	15	56	36	485	6,620	425	353	254	138	85	57	45
.....	14	48	45	440	4,710	425	352	250	138	84	54	44
.....	14	44	42	440	4,180	382	351	246	138	83	53	43
.....	14	42	41	3,190	2,950	382	350	243	132	82	52	42
.....	14	41	46	9,150	2,840	382	349	239	132	82	51	41
.....	14	40	41	2,460	2,500	382	348	235	132	82	49	42
.....	14	39	40	1,880	2,200	340	348	231	132	82	49	42
.....	16	38	39	985	.....	340	346	227	132	81	50	41
.....	16	38	41	820	.....	425	345	223	117	81	50	41
.....	16	.....	47	820	.....	382	.....	219	.....	81	50	.....

[1] See p. 86.

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Monthly discharge of San Gabriel River near Azusa, Cal., for the year ending Sept. 30, 1914

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0	0	0	0	
November	40	0	1.5	89	
December	0	0	0	0	
January	9,150	0	960	59,000	C
February	11,800	215	2,140	119,000	C.
March	2,100	340	761	46,800	C.
April	340	277	296	17,600	C.
May	269	139	196	12,100	C.
June	135	37	81.1	4,830	B.
July	34	1	10.6	652	B.
August	0	0	0	0	
September	0	0	0	0	
The year	11,800	0	359	260,000	

Combined monthly discharge of San Gabriel River and canal near Azusa, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	17	13	14.8	910
November	116	17	38.3	2,280
December	47	31	35.3	2,170
January	9,150	38	999	61,400
February	11,800	267	2,170	121,000
March	2,100	340	781	48,000
April	420	340	360	21,400
May	339	219	275	16,900
June	215	117	161	9,580
July	114	81	90.6	5,570
August	80	49	59.1	3,630
September	53	41	45.8	2,720
The year	11,800	13	408	296,000

PACIFIC LIGHT & POWER CORPORATION'S CANAL[1] NEAR AZUSA, CAL.

LOCATION.—At Pacific Light & Power Corporation's power house, about 1¼ miles north of Azusa.

RECORDS AVAILABLE.—1896 to September 30, 1914.

DISCHARGE.—Computed from records showing kilowatt output of plant, except at low water, when record at power plant is not reliable. Low-water discharge computed from weir records obtained at sand box about one-fourth mile below intake. In compiling these records it is considered that 1 second-foot develops 25 kilowatts.

ACCURACY.—Results good.

[1] Formerly known as San Gabriel power canal.

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discharge, in second-feet, of Pacific Light & Power Corporation's canal near Azusa, Cal., for the year ending Sept. 30, 1914.

›ay.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	13	17	36	44	0	0	0	70	80	80	80	51
.....	14	20	35	45	40	0	0	68	80	80	80	53
.....	14	18	34	44	52	0	40	68	80	80	70	50
.....	15	19	33	45	52	0	80	68	80	80	65	50
.....	17	19	33	44	52	0	80	80	80	80	66	48
.....	17	18	33	42	52	0	68	80	80	80	64	48
.....	16	18	33	41	52	0	66	80	80	80	64	48
.....	15	17	32	40	56	0	66	80	80	80	63	47
.....	15	17	31	40	60	42	68	80	80	80	63	48
.....	16	17	32	40	60	70	68	80	80	80	63	47
.....	16	17	32	39	60	73	68	80	80	80	62	46
.....	15	22	31	38	60	62	68	80	80	80	59	46
.....	15	69	31	38	60	68	68	80	80	80	59	47
.....	15	64	31	38	67	69	68	80	80	80	59	47
.....	15	46	31	60	55	70	68	80	80	80	59	48
.....	15	37	32	60	52	70	76	80	80	80	57	46
.....	15	33	31	60	27	70	68	80	80	80	57	44
.....	14	32	31	60	29	18	68	80	80	80	57	45
.....	14	76	31	60	48	0	68	80	80	80	57	45
.....	13	76	32	60	0	0	68	80	80	80	57	45
.....	14	66	32	60	0	0	68	80	80	80	57	45
.....	15	56	36	60	0	0	68	80	80	80	57	45
.....	14	48	45	60	0	0	68	80	80	80	54	44
.....	14	44	42	60	0	0	68	80	80	80	53	43
.....	14	42	41	30	0	0	68	80	80	80	52	42
.....	14	41	46	0	0	0	68	80	80	80	51	41
.....	14	40	41	0	0	0	68	80	80	80	49	42
.....	14	39	40	0	0	0	69	80	80	80	49	42
.....	16	38	39	0	.....	0	68	80	80	80	50	41
.....	16	38	41	0	.....	0	68	80	80	80	50	41
.....	16	.....	47	0	.....	0	.....	80	.....	80	50	.....

thly discharge of Pacific Light and Power Corporation's canal near Azusa, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
ar.....	17	13	14.8	910
aber.....	76	17	36.8	2,190
iber.....	47	31	35.3	2,170
ry.....	60	0	39.0	2,400
ary.....	67	0	33.4	1,850
.....	73	0	19.7	1,210
.....	80	0	63.5	3,780
.....	80	68	78.5	4,830
.....	80	80	80.0	4,760
.....	80	80	80.0	4,920
t.....	80	49	59.1	3,630
aber.....	53	41	45.8	2,730
The year.....	80	0	48.9	35,400

LOS ANGELES RIVER BASIN.

ARROYO SECO NEAR PASADENA, CAL.

TION.—Near south line of sec. 30, T. 2 N., R. 12 W. (unsurveyed), just below rail crossing at forest ranger station in Angeles National Forest, about 3 miles bove Devils Gate, 5½ miles northwest of Pasadena.

NAGE AREA.—16.4 square miles.

RDS AVAILABLE.—December 1, 1910, to September 30, 1914 (incomplete).

:.—Staff in two sections fastened to an alder tree on right bank 300 feet southeast f ranger station. Observer, R. C. Doughty.

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DISCHARGE MEASUREMENTS.—Made by wading below gage.

CHANNEL AND CONTROL.—Solid rock, gravel, and boulders; somewhat shifting at high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year and for period 1911–1914, 12.5 feet at 10 p. m. February 20 (discharge, computed from extension of rating curve, 5,630 second-feet); minimum stage recorded, 2.98 feet October 2 to 4 (discharge, 0.2 second-foot); minimum stage recorded 1911–1914 somewhat below 2.98 feet, the lower limit of the gage, September 12 to 23, 1913 (estimated discharge, 0.1 second-foot).

ACCURACY.—Estimates for low and medium stages good; high-water extension of rating curve based on a cross section of the channel and slope data obtained after the February flood; flood estimates approximate.

COOPERATION.—Gage-height record furnished by United States Forest Service.

Discharge measurements of Arroyo Seco near Pasadena, Cal., during the year ending Sept. 30, 1914.

[Made by F. C. Ebert.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Feb. 7	3.93	24	Mar. 12	3.97	40	May 4	3.55	13
16	3.74	14	30	3.81	29	June 2	3.38	7.3
26	4.50	162	Apr. 13	3.58	14			

Daily discharge, in second-feet, of Arroyo Seco near Pasadena, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.2	1.5	2	11	60	87	21	17	5.5	3	1.5	2
2	.2	1.5	2	8	51	95	21	16	6	2.5	1.5	1.5
3	.2	1.5	2	5.5	38	104	20	15	6.5	2.5	1.5	1.5
4	.2	1.5	2	4	36	104	20	13	7	2.5	1.5	2
5	.2	2	2	3	32	92	20	12	7	2.5	1.5	2
6	.4	2	2	2.5	29	92	19	12	7.5	2.5	1.5	2
7	.4	2	2	2.5	24	72	19	11	8	2.5	1.5	1.5
8	.4	2	2	2.5	23	62	19	11	8	2.5	1.5	1.5
9	.4	2	2	2.5	21	54	19	11	8	2.5	1.5	1.5
10	.4	2	2.5	2.5	20	54	18	10	8	2.5	1.5	1.5
11	.4	2	2.5	2.5	18	54	18	10	7.5	2.5	1.5	1.5
12	.4	4.5	2.5	2.5	16	47	17	10	7	2.5	1.5	2
13	.4	20	2.5	2.5	15	47	16	9	6.5	2	1.5	2
14	.3	12	3	4	14	33	15	9	6	2	1.5	2
15	.4	5.5	3	24	14	32	15	9	5.5	2	1.5	2
16	.4	4	3	67	14	31	14	9	5.5	2.5	1.5	2
17	.5	3	4	160	14	31	13	8.5	5	2.5	1.5	2
18	.4	7	4	497	684	27	13	8	5	2.5	1.5	2
19	.4	27	4.5	39	712	27	12	7.5	4.5	2.5	1.5	1.5
20	.4	20	5	19	3,690	27	12	7.5	4.5	2	1.5	1.5
21	.4	8	5.5	13	1,820	26	17	7	5	2	1.5	1.5
22	.5	4.5	5.5	10	852	26	21	7	5	2	1.5	1.5
23	.6	3.5	6	8	528	25	18	7	5	2	1.5	1.5
24	.7	2.5	6.5	19	349	24	18	7	4.5	2	1.5	1.5
25	.7	2	7	386	230	24	17	6	4.5	2	1.5	1.5
26	.7	2	7.5	1,750	145	24	15	6	4	2	1.5	2
27	.8	2	8	500	99	24	13	6	3.5	2	1.5	2
28	.9	2	8.5	257	79	24	11	6	3	2	1.5	2
29	1	2	9.5	132	.....	27	18	6	3	1.5	1.5	2
30	1	2	15	87	.....	27	18	5.5	2.5	1.5	1.5	2
31	1.5	.....	16	65	.....	27	.....	5.5	.....	1.5	2	.....

NOTE.—Discharge determined from 3 rating curves fairly well defined below 400 second-feet.

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Monthly discharge of Arroyo Seco near Pasadena, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1.5	0.2	0.51	31	
November	2.7	1.5	5.12	305	B.
December	16	2	4.82	296	B.
January	1,750	2.5	132	8,120	C.
February	3,690	14	344	19,100	C.
March	104	24	46.8	2,880	B.
April	21	11	16.9	1,010	B.
May	17	5.5	9.18	564	B.
June	8	2.5	5.62	334	B.
July	3	1.5	2.23	137	C.
August	2	1.5	1.52	93	C.
September	2	1.5	1.77	105	C.
The year	3,690	.2	45.5	33,000	

FLOOD OF FEBRUARY, 1914, IN LOS ANGELES COUNTY, CAL.[1]

From February 15 to 25, 1914, precipitation was general over a large part of California. In the vicinity of Los Angeles the storm period extended from February 18 to 21, the total precipitation in the four days exceeding 19 inches at stations in the mountains and about 3 inches on the coast. This storm was preceded by heavy general precipitation in January that thoroughly soaked the ground. The monthly departure from the normal for January was much greater than that for February, but the precipitation in January covered 10 to 12 days, whereas that for February occurred within 4 days. The hourly distribution of the rainfall as recorded by the United States Weather Bureau at the station at Los Angeles and the total rainfall for the storm at 40 stations in the Los Angeles district are shown in the following tables:

Hourly precipitation, in inches, for February 18–21, 1914, at Los Angeles, Cal.

[From unpublished records of United States Weather Bureau.]

A. M.

Date.	1	2	3	4	5	6	7	8	9	10	11	12
Feb. 18	0.07	0.06	Tr.	0.01	0.08	0.24	0.33	0.07	0.11	0.15	0.02	0.06
19	.01	.01	.01	.02	.07	.03	Tr.	.....	.....	.....	Tr.	.01
20	.07	.11	.04	.11	.04	Tr.	Tr.	.....	.....	.....	Tr.	.....
21	.02	.06	.03	.01	Tr.	.02	.01	.....	.....	.....	.....	.....

P. M.

Feb. 18	0.50	1.49	0.29	0.28	0.35	0.04	0.08	0.01	0.01	Tr.	Tr.	0.01
19	.....	.....	.....	.....	.....	Tr.	.02	.02	.22	.25	.05	.22
20	.....	Tr.	.24	.03	.01	.21	.36	.25	.15	.01	.06	Tr.
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

[1] Abstracted from reports of the board of engineers for flood control to the board of supervisors, Los Angeles County, and records of the United States Weather Bureau.

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Total precipitation for storm of February 18–21, 1914, at stations in the vicinity of Los Angeles.

[From flood studies at Los Angeles, by Ford A. Carpenter, in Monthly Weather Review, vol. 42, No. 6, June, 1914.]

Station.	Rainfall.	Station.	Rainfall.
	Inches.		*Inches.*
Avalon	3.45	Palo Verde	2.8
Azusa	13.26	Pasadena	11.4
Bear Valley dam	10.83	Pomona	9.6
Chino	4.81	Redlands	4.2
Claremont	10.92	Redondo	2.5
Cleghorn Canyon	17.85	Riverside	2.2
Corona	4.31	San Antonio Canyon	12.2
Devil Canyon	8.63	San Bernardino	4.7
East Highlands	4.85	San Dimas	11.2
Fillmore	6.44	San Fernando	8.8
Garvanza	9.41	San Pedro	2.6
Highland	5.68	Santa Monica	5.5
Hollywood	6.75	Sierra Madre	15.8
Long Beach	3.24	Squirrel Inn	16.2
Los Angeles	7.07	Tustin	2.8
Mill Creek	11.10	Valyermo, post office	5.5
Mount Lowe	19.20	Venice	5.1
Mount Wilson	19.40	Ventura	10.2
Orange	3.55	Walnut	6.5
Palm Springs	3.90	Whittier	5.6

The storm of February 18–21, 1914, coming when the ground was already thoroughly soaked, produced a flood in the vicinity of Los Angeles that caused the most damage but was not the greatest in history. The loss by flood in Los Angeles County in 1914 has been estimated by the board of engineers for flood control at $10,000,000, exclusive of damage to the harbor due to silting. The flood left high-water marks which were still visible when the board of engineers for flood control was organized in April, 1914, and steps were taken immediately to obtain data from which the flood flow at various points could be computed. Under the direction of J. B. Lippincott, of the board of engineers for flood control, sections were selected and data and information collected for computing flood flow. The results obtained for sections on Los Angeles and San Gabriel rivers and tributaries are shown in the following table:

Estimated flood discharge of streams in vicinity of Los Angeles from storms of January and February, 1914.

Los Angeles River basin.

Stream.	Location of section.	Drainage area.		Value of "n."	Discharge in second-feet.	
		Square miles.	Per cent mountainous.		Flood.	Per square mile.
Los Angeles River	200 feet below bridge on Lankershim Boulevard.	304.3	72.6	0.0375	16,780	55.2
Do	200 feet below filtration galleries	334.8	72.4	.0375	24,420	73.2
Do	Below Main Street Bridge	534.1	68	.025	31,140	58.3
Paconna Creek	1,000 feet below mouth of canyon	30	100	.05	5,400	180
Big Tujunga Canyon	Mouth of canyon	118	100	.0375	13,600	115
Sunland Wash	Below road from Sunland up Big Tujunga Canyon.	6.5	60	.0275	4,620	712
Little Tujunga Canyon	Below bridge on road from San Fernando up Tujunga Valley.	22.3	100	.03	4,100	184
Verdugo Creek	¼ mile below Verdugo Park	21.9		.03	7,700	352
Arroyo Seco	About 300 feet below Devils Gate	30.5	88.5	.025	11,400	374
Do	About 500 feet below the Colorado Street Bridge.	38.6	75.2	.04	14,136	366
Do	North end of San Pasqual Avenue.	42.7	70.3	.045	7,610	178
Do	Between Pasadena Avenue and Santa Fe Ry. bridge near Avenue 36.	49.5		.025	5,880	119

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Estimated flood discharge of streams in vicinity of Los Angeles from storms of January and February, 1914—Continued.

San Gabriel River basin.

Stream.	Location of section.	Drainage area.		Value of "n."	Discharge in second feet.	
		Square miles.	Per cent mountainous.		Flood.	Per square mile.
San Gabriel River	2 miles above mouth of San Gabriel Canyon.	220	100	0.035	25,260	115
Do	Below mouth of Rogers Canyon	226.68	100	.035	26,680	117
Do	Dunlap road crossing, ¼ mile below Whittier Boulevard Bridge.	.....	.....	.030	16,000	.....
Sawpit Canyon	300 feet above point where wash begins to spread, northeast of Monrovia.	7.37	100	.05	4,070	550
Santa Anita Canyon	500 feet above Foothill Boulevard, below junction of Little Anita Canyon.	18.17	100	.045	3,168	174
San Dimas Canyon	Mouth of canyon	18.58	100	.035	2,950	159
Big Dalton Canyon	Mouth of canyon, opposite spillway of Glendora water supply.	7.56	100	.05	1,070	142
Little Dalton Canyon	Mouth of canyon	3.34	100	.05	1,018	305
Eaton Wash	Between Foothill Boulevard and Santa Fe Ry. bridge.	12.5	82.4	.035	4,590	367
Rio Hondo	About 500 feet below Foster Bridge on Downey Boulevard.	.....	.....	.025	20,930	.....

Ballona Creek basin.

Ballona Creek	About 500 feet below the wagon bridge on Higuera or Valley road.	.....	.....	0.035	6,480	.....

VENTURA RIVER BASIN.

VENTURA RIVER NEAR NORDHOFF, CAL.

LOCATION.—In the N. ½ SW. ¼ sec. 28, T. 5 N., R. 23 W., just below junction of Matilija and North Fork of Matilija creeks, about 4 miles northwest of Nordhoff.

DRAINAGE AREA.—19.9 square miles.

RECORDS AVAILABLE.—October 23, 1911, to October 31, 1914, when station was discontinued.

GAGE.—Vertical staff in three sections on right bank about 300 feet below junction of creeks; gage destroyed by flood of January, 1914; a new vertical staff, at an independent datum, installed March 17, 1914, about 50 feet below original site. Observer, P. W. Soper.

DISCHARGE MEASUREMENTS.—Made from cable about 200 feet below gage or by wading; equipment washed out February 20, 1914.

CHANNEL AND CONTROL.—Gravel and boulders; shifts during high water.

EXTREMES OF DISCHARGE.—Maximum stage during year and for period 1912–1914, probably about 15 feet February 20 or 21, 1914 (discharge unknown); minimum stage recorded 1912–1914, 1.90 feet October 1 to 3 and 13 to 18, 1913 (discharge, 2.5 second-feet).

DIVERSION.—Sheldon flume diverts water from North Fork of Matilija Creek above the station during the irrigation season. See miscellaneous measurements (p. 326) for discharge of flume.

ACCURACY.—Rating curves well defined for low and medium stages; results good. No high-water estimates prepared.

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Discharge measurements of Ventura River near Nordhoff, Cal., during the year ending Sept. 30, 1914.

[Made by F. C. Ebert.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Oct. 22	1.94	2.8	Mar. 17	2.67	178	May 30	1.67	38
Jan. 16	2.67	14	Apr. 9	2.26	102	Sept. 19	1.17	13
Feb. 13	4.93	151						

NOTE.—Measurements beginning Mar. 17, 1914, refer to new gage at new site and datum.

Daily discharge, in second-feet, of Ventura River near Nordhoff, Cal., for the period Oct. 1, 1913, to Oct. 31, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.
1	2.5	3.5	10	16	.....	142	63	34	23	16	10	10
2	2.5	3.5	10	16	.....	142	63	34	23	16	10	10
3	2.5	3.5	10	16	.....	133	63	34	23	14	10	10
4	2.5	3.5	10	14	.....	133	63	34	23	14	10	10
5	2.5	3.5	10	14	.....	124	58	34	20	14	10	10
6	2.5	3.5	10	14	.....	124	58	34	20	14	10	10
7	3.0	3.5	9	14	.....	116	58	34	20	14	10	10
8	3.0	3.5	9	14	.....	108	58	34	20	14	10	10
9	3.0	4.0	9	14	.....	101	58	31	20	14	10	10
10	2.5	4.5	9	14	.....	94	58	31	20	14	10	10
11	2.5	4.5	9	14	.....	87	58	31	20	14	10	10
12	2.5	12	9	14	.....	87	58	31	20	14	10	10
13	2.5	88	10	12	.....	80	53	31	20	14	10	10
14	2.5	19	10	12	.....	80	53	28	18	14	10	10
15	2.5	12	10	54	.....	74	53	28	18	14	10	8.5
16	2.5	10	10	260	.....	74	53	28	18	14	10	8.5
17	2.5	10	10	.....	174	74	53	28	18	14	10	8.5
18	2.5	12	10	.....	174	74	53	28	18	14	10	8.5
19	2.5	54	10	.....	163	68	53	28	18	14	10	8.5
20	2.5	23	10	.....	163	68	53	28	18	14	10	8.5
21	2.5	19	10	.....	152	68	48	28	18	14	10	8.5
22	2.5	16	19	.....	152	68	48	28	18	14	10	8.5
23	2.5	14	16	.....	142	68	48	26	18	14	10	8.5
24	2.5	12	14	.....	142	68	48	26	18	14	10	8.5
25	2.5	11	14	.....	142	68	48	26	18	14	10	8.5
26	3.0	11	12	.....	142	68	44	26	16	14	10	8.5
27	3.0	11	12	.....	142	68	44	26	16	12	10	8.5
28	3.0	10	14	.....	142	68	40	26	16	12	10	8.5
29	3.0	10	14	.....	142	68	40	26	16	12	10	8.5
30	3.5	10	21	.....	142	68	37	26	16	12	10	8.5
31	3.5	.....	16	.....	142	.....	34	.....	16	12	.....	8.5

Monthly discharge of Ventura River near Nordhoff, Cal., for the years ending Sept. 30, 1914–1915.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1913–14.					
October	3.5	2.5	2.68	165	A.
November	88	3.5	13.5	803	A.
December	21	9	11.5	707	A.
January 1–16	260	12	32.0	1,020	B.
March 17–31	174	142	150	4,460	
April	142	68	88.8	5,280	A.
May	63	34	52.2	3,210	A.
June	34	26	29.6	1,760	A.
July	23	16	18.8	1,160	A.
August	16	12	13.8	848	A.
September	10	10	10.0	595	A.
1914.					
October	10	8.5	9.18	564	B.

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VENTURA RIVER NEAR VENTURA, CAL.

LOCATION.—At highway bridge in Foster Memorial Park, near southeast corner of Santa Ana grant, below Ventura Water Co.'s diversion dam, one-fourth mile below mouth of Coyote Creek, and about 5 miles north of Ventura and mouth of river.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 4, 1911, to January 17, 1914, when station was discontinued.

GAGE.—Standard chain gage fastened to downstream side of bridge; destroyed by flood in January. Observer, J. B. Train.

DISCHARGE MEASUREMENTS.—Made from bridge (destroyed by January flood) at gage or by wading.

CHANNEL AND CONTROL.—Gravel and boulders; shifts during high water.

EXTREMES OF DISCHARGE.—1911–1914: Maximum stage recorded, 9.0 feet at 11 a. m. February 24, 1913 (discharge, computed from extension of rating curve, 3,940 second-feet; undoubtedly discharge has been higher); minimum stage recorded, 1.3 feet December 30, 1912, to January 5, 1913 (discharge, 2 second-feet).

DIVERSIONS.—Diversion for irrigation from main river and tributaries above the station. Pipe line for irrigation and municipal water supply in the vicinity of Ventura heads just above the dam.

ACCURACY.—Rating curve well defined; results good.

Discharge measurements of Ventura River near Ventura, Cal., during the year ending Sept. 30, 1914.

[Made by F. C. Ebert.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Oct. 23	1.40	4.3
Jan. 5	1.48	7.2

Daily discharge, in second-feet, of Ventura River near Ventura, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Day.	Oct.	Nov.	Dec.	Jan.
1	5	4	5	6.5	16	5	6.5	5	445
2	5	4	5	6.5	17	5	5	5	125
3	5	4	5	8	18	5	5	5	.....
4	5	4	5	8	19	5	44	5	.....
5	5	4	5	8	20	5	17	5	.....
6	5	4	5	8	21	5	8	5	.....
7	5	4	5	8	22	5	8	12	.....
8	5	4	5	8	23	5	6.5	8	.....
9	5	4	5	8	24	5	6.5	6.5	.....
10	5	4	5	8	25	5	6.5	6.5	.....
11	5	4	5	8	26	5	6.5	6.5	.....
12	5	4	5	8	27	4.5	6.5	6.5	.....
13	5	27	5	8	28	4	5.5	6.5	.....
14	5	12	5	8	29	4	5	6.5	.....
15	5	8	5	100	30	4	5	6.5	.....
					31	4	.....	6.5	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge Dec. 25 and Jan. 1 interpolated; that of Jan. 15 estimated from station at Nordhoff.

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Monthly discharge of Ventura River near Ventura, Cal., for the year ending Sept. 30, 19

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Ac in
	Maximum.	Minimum.	Mean.		
October	5	4	4.85	298	R
November	44	4	7.88	469	R
December	12	5	5.71	351	R
January 1-17	445	6.5	45.8	1,540	R
The period				2,660	

SANTA YNEZ RIVER BASIN.

SANTA YNEZ RIVER NEAR SANTA BARBARA, CAL.

LOCATION.—In the SE. ¼ SE. ¼ sec. 10, T. 5 N., R. 27 W., one-fourth mile bel Gibraltar dam site, about 7 miles north of Santa Barbara. Mono Creek enter miles above the station.

DRAINAGE AREA.—218 square miles, measured on topographic map.

RECORDS AVAILABLE.—November 1, 1903, to April 30, 1907; October 1, 1907, to Jan ary 31, 1908; February 6, 1910, to September 30, 1914. Station was maintain about 5 miles above present site November 21, 1902, to June 20, 1903.

GAGE.—Staff in three sections about 900 feet below north portal of the Santa Barba water-supply tunnel. On April 13, 1911, gage datum was lowered 5.00 feet Observer, W. M. Coffey.

DISCHARGE MEASURMENTS.—Made from cable 50 feet below gage or by wading equipment washed out January 18, 1914.

CHANNEL AND CONTROL.—Sand and gravel; shifts at high water; relatively permanen at low water.

EXTREMES OF DISCHARGE.—Maximum stage during year and for period 1904–1914, 23.0 feet at 8 p. m. January 25 (discharge, computed from extension of rating curve, 13,100 second-feet); minimum stage during year, 4.25 feet October 21 to November 12 (discharge, 0.1 second-foot). No flow during most of July to September, 1904.

ACCURACY.—Rating curves fairly well defined for low and medium stages; results good; high-water discharges approximate.

COOPERATION.—Station maintained in cooperation with Santa Barbara Water Commission.

Discharge measurements of Santa Ynez River near Santa Barbara, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 7	F. C. Ebert	4.80	13	Mar. 14	W. M. Coffey	5.87	260
7	W. M. Coffey	4.80	13	15	do	5.79	240
8	do	4.80	14	16	do	5.74	239
9	do	4.78	13	17	do	5.69	223
10	do	4.76	11	18	do	5.67	223
11	do	4.75	11	19	do	5.62	210
12	do	4.75	11	20	do	5.57	203
13	do	4.74	11	27	do	5.42	182
14	do	4.75	11	Apr. 11	do	5.13	106
15	do	5.28	66	21	do	5.02	89
16	do	6.52	405	28	do	4.94	71
17	do	5.95	192	May 4	do	4.85	58
Feb. 7	do	5.90	238	12	do	4.74	49
8	do	5.78	246	17	do	4.72	48
9	do	5.71	220	26	do	4.66	42
9	do	5.71	223	June 3	do	4.57	33
10	do	5.66	218	16	do	4.45	22
11	do	5.61	203	24	do	4.41	18
12	F. C. Ebert	5.53	174	30	do	4.34	12
13	W. M. Coffey	5.49	169	July 7	do	4.31	11
17	do	5.33	135	18	do	4.27	9.9
Mar. 4	do	5.26	136	Aug. 3	do	4.18	3.9
12	do	5.99	304	3	do	4.18	4.3
13	do	5.90	277				

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Discharge, in second-feet, of Santa Ynez River near Santa Barbara, Cal., for the year ending Sept. 30, 1914.

r.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	0.1	0.1	3	31	490	650	147	71	34	14	5	2
.....	.1	.1	3	22	431	610	135	76	33	13	5	2
.....	.1	.1	3	19	375	570	127	67	33	13	5	2
.....	.1	.1	3	16	340	530	126	64	33	12	5	2
.....	.1	.1	3	16	324	490	131	62	32	12	5	2
.....	.1	.1	3	15	279	450	120	57	31	12	5	2
.....	.1	.1	3	15	261	412	116	57	32	11	5	2
.....	.1	.1	3	14	330	375	114	55	32	11	4	2.5
.....	.1	.1	3	13	330	357	111	55	31	11	4	2
.....	.1	.1	3	12	217	340	111	53	28	11	4	2
.....	.1	.1	3	11	204	340	104	52	26	11	4	2
.....	.1	.1	3	11	188	302	98	50	26	11	4	2
.....	.1	345	3	10	176	285	96	50	24	11	3.5	2.5
.....	.1	45	3	10	176	271	94	50	23	11	4.5	2
.....	.1	8	3	60	157	250	93	50	22	11	3.5	2
.....	.1	4	3	332	155	243	88	48	22	10	3.5	2
.....	.1	2	3	165	139	227	87	48	22	10	3	2
.....	.1	8	3	2,350	2,360	222	84	47	22	10	3	2
.....	.1	78	4	770	1,060	207	81	46	22	8.5	3	2
.....	.1	9	4	590	8,350	195	78	44	21	9	2.5	2
.....	.1	5	4	450	4,750	190	87	42	20	8	3	2
.....	.1	5	11	390	1,600	178	93	41	20	7.5	2.5	2
.....	.1	4	17	370	1,600	173	84	40	20	7.5	2.5	2
.....	.1	4	11	680	1,160	166	84	41	19	7.5	2.5	2
.....	.1	4	14	8,500	1,020	160	81	42	18	6.5	2.5	2
.....	.1	4	8	3,030	915	155	78	42	17	6	2.5	2
.....	.1	4	7	2,360	780	157	76	39	17	6	2.5	2
.....	.1	4	6	1,660	690	151	76	38	15	5.5	2	2
.....	.1	4	6	1,120	.....	200	73	37	14	6	2	2
.....	.1	3	53	630	.....	178	71	36	14	6	2	2
.....	.1	.....	47	550	.....	157	.....	36	.....	6	2	.....

.—Discharge determined from 2 fairly well defined rating curves.

ily discharge of Santa Ynez River near Santa Barbara, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
r.....	0.1	0.1	0.10	6	
ıber.....	345	.1	18.0	1,070	C.
ber.....	53	3	7.9	486	C.
y.....	8,500	10	797	49,000	D.
ıry.....	8,350	139	1,030	57,000	D.
.....	650	151	296	18,200	C.
.....	147	71	98.1	5,840	B.
.....	76	36	49.5	3,040	B.
.....	34	14	24.1	1,430	B.
.....	14	5.5	9.52	585	C.
.....	5.0	2.0	3.47	213	C.
ıber.....	2.5	2.0	2.03	121	D.
The year.....	8,500	.1	190	137,000	

SANTA YNEZ RIVER NEAR LOMPOC, CAL.

TION.—At highway bridge near east boundary of La Mision Vieja de la Purisima rant, about 1½ miles east of Lompoc.

NAGE AREA.—725 square miles.

RDS AVAILABLE.—November 10, 1906, to January 9, 1907, and September 25, 907, to September 30, 1914.

.—Vertical staff fastened to pier of bridge. Observer, Donald McDonald.

IARGE MEASUREMENTS.—Made from bridge or by wading.

NEL AND CONTROL.—Shifting sand.

EMES OF DISCHARGE.—Maximum stage during the year and for period 1907–914, 13.0 feet during the night of January 25 (discharge, computed from extension of rating curve, 41,800 second-feet); minimum stage for period, 2.4 feet October 13 to 21 (*discharge, 5 second-feet*).

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DIVERSIONS.—Water is not diverted above the station, but water for irrigation is pumped from wells along the banks of the river.

ACCURACY.—Discharge computed from rating tables covering short periods and by indirect method for shifting channels; high-water records approximate; for other stages record fair.

COOPERATION.—Station maintained in cooperation with Santa Barbara Water Commission.

Discharge measurements of Santa Ynez River near Lompoc, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Nov. 12	Donald McDonald.....	2.61	26	Mar. 23	Donald McDonald.....	0.40	844
20	.....do.....	2.96	194	31	.....do.....	.50	699
Dec. 8	.....do.....	2.60	25	Apr. 6	.....do.....	.50	494
15	.....do.....	2.60	29	11	.....do.....	.40	367
Jan. 6	.....do.....	2.79	79	13	.....do.....	.40	366
13	.....do.....	2.60	54	20	.....do.....	.30	269
15	.....do.....	3.30	352	May 11	.....do.....	.06	169
21	.....do.....	2.25	1,230	16	.....do.....	.10	182
27	.....do.....	3.25	7,920	18	R. F. Cowles.....	.13	154
30	.....do.....	2.05	2,540	25	Donald McDonald.....	.04	144
Feb. 2	.....do.....	1.40	1,400	28	.....do.....	.10	124
9	R. F. Cowles.....	1.25	651	28	F. C. Ebert.....	.10	119
19	.....do.....	3.20	10,900	June 1	Donald McDonald.....	.11	128
22	Donald McDonald.....	2.10	7,530	13	.....do.....	.04	105
28	R. F. Cowles.....	.70	2,280	July 17	.....do.....	—.08	33
Mar. 9	Donald McDonald.....	.50	1,010	Aug. 8	.....do.....	—.22	34
14	.....do.....	.50	861	Sept. 12	.....do.....	—.25	34
16	.....do.....	.50	821				

Daily discharge, in second-feet, of Santa Ynez River near Lompoc, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	11	11	17	314	1,600	2,500	635	217	126	48	37	34
2	11	11	17	143	1,400	1,700	605	212	125	48	37	34
3	11	11	17	142	1,200	1,650	575	207	123	48	36	34
4	11	11	24	110	1,600	1,350	545	202	122	47	36	34
5	11	11	24	81	1,600	1,300	515	197	120	47	35	34
6	11	11	24	79	1,200	1,220	484	192	119	47	35	34
7	11	11	24	75	1,200	1,150	460	187	117	46	34	34
8	11	11	24	71	900	1,080	437	182	116	46	34	34
9	11	11	24	68	651	1,010	414	177	114	45	34	34
10	7	11	24	64	600	980	391	172	113	45	34	34
11	7	11	17	61	600	950	367	168	111	45	34	34
12	7	17	17	57	600	920	368	164	110	44	34	34
13	5	92	17	54	350	890	368	161	108	44	34	34
14	5	150	29	54	350	861	353	158	94	44	34	34
15	5	227	29	275	200	841	339	155	80	43	34	33
16	5	119	28	600	200	821	325	152	67	43	34	33
17	5	51	28	2,200	200	795	311	153	53	42	34	33
18	5	24	27	30,800	6,650	770	297	152	53	42	34	33
19	5	92	16	4,250	10,900	745	283	150	53	42	34	33
20	5	227	26	2,200	24,800	720	268	149	52	41	34	33
21	5	119	15	1,230	25,500	695	264	148	52	41	34	33
22	11	69	25	725	7,530	670	260	147	52	41	34	31
23	11	51	25	500	6,050	644	256	146	51	40	34	31
24	11	24	24	2,800	4,050	646	252	145	51	40	34	31
25	11	24	92	22,200	2,750	649	247	144	51	40	34	30
26	11	17	51	22,000	2,350	652	242	136	50	39	34	30
27	11	17	35	7,920	2,000	655	237	129	50	39	34	30
28	11	17	23	4,650	2,280	658	232	122	50	39	34	29
29	11	17	22	3,750	.....	661	227	123	49	38	34	29
30	11	17	88	2,540	.....	664	222	124	49	38	34	29
31	11	.....	87	2,000	.....	666	.....	125	.....	37	34	.....

NOTE.—High-water discharge October to January read from curves or computed by indirect method; discharge Mar. 9 to Sept. 30 interpolated between measurements, except for slight rise Mar. 29–30, as the stage was falling gradually.

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onthly discharge of Santa Ynez River near Lompoc, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
tober	11	5	8.9	547	C.
vember	227	11	49.7	2,960	C.
cember	92	15	30.3	1,860	C.
nuary	30,800	54	3,610	222,000	D.
bruary	25,500	200	3,900	217,000	D.
rch	2,500	644	952	58,500	C.
ril	635	222	359	21,400	C.
y	217	122	161	9,900	C.
ne	126	49	82.7	4,920	C.
ly	48	37	42.9	2,640	C.
gust	37	34	34.4	2,120	C.
ptember	34	29	32.4	1,930	C.
The year	30,800	5	754	546,000	

SALINAS RIVER BASIN.

ARROYO SECO NEAR SOLEDAD, CAL.

OCATION.—In sec. 21, T. 19 S., R. 6 E., at Pettitt's ranch, about 15 miles south of Soledad.

RAINAGE AREA.—215 square miles.

ECORDS AVAILABLE.—January 1, 1901, to September 30, 1914.

AGE.—Staff in two sections on right bank. Observer, Mrs. Charles Pettitt.

ISCHARGE MEASUREMENTS.—Made from cable 400 feet below gage or by wading.

HANNEL AND CONTROL.—Gravel; fairly permanent except during high water.

XTREMES OF DISCHARGE.—Maximum stage recorded during year and for period 1901–1914, 20.5 feet during night of January 25 (discharge, computed from extension of rating curve, 17,500 second-feet); channel dry October 1 to November 13, 1913, and during periods in 1902 to 1904, 1906, 1908, and 1914.

CCURACY.—Frequent discharge measurements are made. Rating curves well defined; results good.

ischarge measurements of Arroyo Seco near Soledad, Cal., during the year ending Sept. 30, 1914.

[Made by Charles Pettitt.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
ov. 14	4.09	37	Jan. 13	10.95	4,380	Apr. 15	4.60	182
ec. 23	5.32	301	19	8.35	2,110	May 10	4.23	110
26	5.82	422	22	[a] 8.20	2,220	June 23	3.70	37
29	4.70	131	Mar. 21	4.92	281	July 26	3.32	14
31	8.48	1,930						

[a] Stage as high as 9.0 feet during measurement.

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Daily discharge, in second-feet, of Arroyo Seco near Soledad, Cal., for the year ending Sept. 30, 1914.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0	30	6,480	487	588	468	132	65	27	12	9
2	0	28	1,990	396	567	274	132	64	25	12	9
3	0	26	1,480	347	527	233	132	63	24	12	10
4	0	24	985	288	527	207	130	61	24	11	10
5	0	22	835	260	507	317	126	60	24	11	10
6	0	21	608	246	487	274	118	60	23	11	10
7	0	21	527	233	487	246	113	54	22	11	10
8	0	21	448	207	468	233	109	60	22	10	10
9	0	20	396	195	448	233	109	60	22	10	10
10	0	20	347	183	412	233	109	58	22	9	9
11	0	19	332	161	396	233	106	55	21	9	9
12	0	19	317	161	396	220	104	54	21	9	9
13	0	20	3,980	151	363	207	101	50	21	9	8
14	40	26	2,230	145	347	195	96	48	20	8	8
15	21	24	1,840	132	317	183	96	46	19	8	8
16	9	24	1,280	126	317	183	96	42	19	8	8
17	9	24	5,020	122	317	172	93	40	18	8	8
18	12	24	7,740	935	302	161	91	39	18	8	8
19	440	23	2,230	1,210	288	157	90	39	17	8	8
20	60	24	1,550	6,970	288	153	88	38	16	8	8
21	38	28	1,210	3,520	260	151	85	37	16	7	9
22	35	52	1,760	1,480	260	151	80	37	15	8	9
23	30	340	1,280	1,280	246	149	80	37	15	8	9
24	28	325	6,140	1,040	233	147	96	37	15	8	9
25	26	825	13,300	885	233	147	98	35	15	8	10
26	20	475	5,570	787	233	145	90	35	14	8	10
27	21	255	1,990	650	233	143	85	32	13	8	10
28	60	185	1,150	629	233	141	80	31	13	8	10
29	40	174	885	.....	448	141	76	30	13	9	10
30	30	198	694	.....	547	141	73	28	13	9	10
31	.....	5,760	567	.....	507	.....	66	.....	12	9	.....

NOTE.—Discharge determined from 2 well-defined rating curves. No flow Oct. 1 to Nov. 13.

Monthly discharge of Arroyo Seco near Soledad, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 215 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	0	0	0.0	.000	.00	0	
November	440	0	30.6	.142	.16	1,820	B.
December	5,760	19	293	1.36	1.57	18,000	B.
January	13,300	317	2,420	11.3	13.03	149,000	B.
February	6,970	122	830	3.86	4.02	46,100	B.
March	588	233	380	1.77	2.04	23,400	B.
April	468	141	201	.935	1.04	12,000	A.
May	132	66	99.4	.462	.53	6,110	A.
June	65	28	46.5	.216	.24	2,770	A.
July	27	12	18.7	.087	.10	1,150	A.
August	12	7	9.1	.042	.05	560	B.
September	10	8	9.2	.043	.05	547	B.
The year	13,300	0	361	1.68	22.83	261,000	

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ALAMEDA CREEK BASIN.

ALAMEDA CREEK AT SUNOLGLEN, CAL.

LOCATION.—In SE. ¼ sec. 7, T. 4 S., R. 1 E., at Sunol dam, about 1 mile below junction with Arroyo de la Laguna and 1 mile west of Sunolglen.

DRAINAGE AREA.—620 square miles (measured by Spring Valley Water Co.).

RECORDS AVAILABLE.—October 4, 1900, to September 30, 1914.

GAGE.—Gurley electric water-stage recorder on upstream face of dam on left bank; prior to 1914 a staff gage on upstream side of dam on right bank.

DISCHARGE MEASUREMENTS.—Made from suspension footbridge about 400 feet above dam. Heavy weights and stayline were used to insure correct position of current meter in high-water measurements.

CHANNEL AND CONTROL.—Concrete dam acts as a control for the station. Channel above and below dam composed of gravel and boulders; shifts during high water.

DIVERSIONS.—See Spring Valley Water Co.'s aqueduct near Sunolglen (p. 109).

ACCURACY.—Dam has been rated in accordance with cooperative agreement between the Spring Valley Water Co. and the city of San Francisco. Current-meter measurements were obtained by both parties between December, 1913, and February, 1914, and a rating curve developed, dated March 23, 1914, which was approved by F. C. Herrmann, consulting engineer for the Spring Valley Water Co., and M. J. Bartell, hydraulic engineer, city engineer's office. This rating curve was used for the entire period for which record is published.

COOPERATION.—Records furnished in million gallons per day by the Spring Valley Water Co. through F. C. Herrmann, chief engineer, and G. A. Elliott, engineer; daily discharge converted into second-feet and monthly discharge computed by engineers of United States Geological Survey.

Daily discharge, in second-feet, of Alameda Creek at Sunolglen, Cal., for the years ending Sept. 30, 1901–1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1900-1901.											
1	.....	12	33	33	76	378	76	229	30	18	7.6
2	.....	12	24	33	70	311	73	142	28	18	5.3
3	.....	11	24	31	70	264	94	128	26	18	4.2
4	10	11	26	61	82	229	88	94	26	17	3.4
5	12	12	26	1,130	3,840	204	82	76	26	15	3.4
6	11	12	26	625	2,100	188	82	70	24	15	5.3
7	10	12	26	600	935	172	79	62	24	15.	5.3
8	10	11	15	574	1,310	157	73	59	24	13	5.3
9	10	11	15	548	1,010	142	70	57	24	12	6.4
10	9.7	11	15	522	700	135	65	49	24	12	6.4
11	9.4	11	15	497	520	343	59	44	24	10	2.0
12	9.4	11	15	471	414	282	59	44	22	8.9	3.4
13	9.4	11	15	445	365	196	59	44	22	8.9	3.4
14	9.4	11	15	419	439	164	59	39	22	8.9	4.2
15	9.4	11	40	342	402	157	59	37	22	8.9	4.2
16	9.4	15	40	252	321	142	57	34	22	4.2	4.2
17	9.4	16	99	219	291	128	54	34	22	4.2	1.8
18	9.4	14	179	203	264	128	54	34	22	4.2	2.0
19	13	14	126	187	1,560	124	49	34	22	4.2	1.8
20	17	16	126	157	1,730	114	49	34	22	4.2	.....
21	12	8,260	126	166	1,010	107	49	48	22	4.2	.....
22	12	2,110	126	244	797	104	49	51	22	4.2	.....
23	12	677	76	172	2,650	101	49	39	22	2.0	.....
24	12	125	76	143	3,010	98	49	30	22	2.6	.....
25	12	99	55	122	1,820	94	39	35	22	6.4	.....
26	11	55	55	102	935	94	39	41	22	8.9	.....
27	11	40	40	96	607	94	39	48	22	8.9	.....
28	12	43	40	90	466	88	39	41	22	8.9	.....
29	11	43	40	84	.....	85	107	39	20	7.6	.....
30	11	33	40	81	.....	82	180	34	20	7.6	.....
31	12	.....	40	78	.....	79	.....	34	.....	7.6	.....

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Daily discharge, in second-feet, of Alameda Creek at Sunolglen, Cal., for the years ending Sept. 30, 1901–1914—Continued.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1901–2.										
1	.....	1.7	6.5	6.5	714	125	56	27	4.6	5.0
2	.....	1.7	6.5	6.5	4,130	125	56	27	4.6	5.0
3	.....	1.7	6.5	6.5	1,880	151	56	27	4.8	5.0
4	.....	125	6.5	6.5	882	125	56	27	4.8	5.0
5	.....	40	6.5	6.5	677	125	56	27	4.8	5.0
6	.....	100	6.5	6.5	1,160	125	56	27	4.8	5.0
7	.....	56	6.5	6.5	882	179	56	27	4.8	7.8
8	.....	27	6.5	6.5	789	299	56	27	4.8	5.0
9	.....	16	6.5	6.5	2,900	237	56	27	4.8	5.0
10	.....	16	6.5	40	1,250	208	56	27	4.8	5.0
11	.....	16	16	27	882	179	40	27	4.8	5.0
12	.....	16	16	76	643	179	40	16	5.0	5.0
13	.....	6.5	6.5	125	535	151	40	16	5.0	5.0
14	.....	6.5	6.5	56	430	125	40	16	5.0	1.7
15	.....	6.5	6.5	237	365	125	40	6.5	5.0	.6
16	.....	6.5	6.5	267	299	99	40	6.5	5.0	.6
17	.....	6.5	6.5	267	237	99	40	6.5	5.0	.07
18	.....	6.5	6.5	237	237	99	27	6.5	5.0	.07
19	1.1	6.5	6.5	151	208	99	27	6.5	5.0	.....
20	1.0	6.5	6.5	99	208	99	27	6.5	5.0	.....
21	1.4	6.5	6.5	99	179	99	27	6.5	5.0	.....
22	1.2	6.5	6.5	2,760	179	99	27	6.5	5.0	.....
23	1.2	6.5	6.5	751	237	99	27	6.5	5.0	.....
24	1.2	6.5	6.5	2,230	208	99	27	6.5	5.0	.....
25	1.2	6.5	6.5	1,560	179	99	27	6.5	5.0	.....
26	1.2	6.5	6.5	2,110	208	76	27	5.4	5.0	.....
27	1.3	6.5	6.5	1,880	179	76	27	5.0	5.0	.....
28	1.6	6.5	6.5	1,560	151	76	27	4.8	5.0	.....
29	1.5	6.5	6.5	.....	151	76	27	4.6	5.3	.....
30	1.7	6.5	6.5	.....	125	56	27	4.6	5.3	.....
31	.....	6.5	6.5	.....	125	.....	27	.....	7.8	.....

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1902–3.									
1	.....	0.07	1.5	883	41	5,270	77	16	7.0
2	.....	.07	1.5	643	41	2,590	77	16	7.0
3	.....	.1	1.5	431	56	1,320	56	7.0	7.0
4	.....	.2	1.5	365	100	976	56	7.0	2.6
5	.....	.2	1.6	332	208	678	56	7.0	2.6
6	.....	.2	1.6	268	268	536	56	2.6	2.6
7	.....	.2	1.6	238	208	431	56	2.6	.6
8	.....	.2	1.7	1,880	180	365	56	2.6	.2
9	.....	.2	1.7	1,070	238	332	41	2.6	.07
10	0.6	.2	2.0	536	180	268	41	2.6	.06
11	.6	.6	2.2	397	152	268	41	2.6	.01
12	.4	2.6	2.6	365	126	208	41	2.6	.....
13	.2	2.0	7.0	268	152	208	41	2.6	.....
14	.2	1.5	2.6	238	1,160	180	41	2.6	.....
15	.2	1.1	2.6	180	572	180	41	2.6	.....
16	.2	.6	2.6	152	466	152	41	2.6	.....
17	.2	.6	2.6	152	607	180	41	2.6	.....
18	.2	.6	2.6	126	431	180	41	2.6	.....
19	100	.4	2.6	100	365	152	27	2.6	.....
20	41	.4	2.6	100	1,230	126	27	2.2	.....
21	16	.4	2.6	77	268	126	27	1.7	.....
22	1.5	.6	7.0	77	208	126	27	1.5	.....
23	.6	.6	7.0	77	180	100	27	1.0	.....
24	.2	.6	7.0	56	180	100	27	1.0	.....
25	.2	.6	431	56	300	100	27	1.0	.....
26	.1	1.5	238	56	268	100	27	1.0	.....
27	.1	1.5	3,490	56	126	77	27	1.0	.....
28	.07	1.2	2,130	41	1,290	77	16	.6	.....
29	.07	1.2	666	.....	1,930	77	16	.4	.....
30	.07	1.2	409	.....	2,780	77	16	.07	.....
31	.....	1.2	832	.....	6,680	.....	16	.....	.....

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ischarge, in second-feet, of Alameda Creek at Sunolglen, Cal., for the years ending Sept. 30, 1901–1914—Continued.

	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.											
			1.0	2.6	466	607	208	41	1.7	0.8	
			1.0	2.2	332	501	208	27	1.7	.8	
			1.0	2.0	268	431	180	27	1.6	.8	
			1.2	2.0	208	365	180	27	1.7	.8	
			1.0	16	180	300	152	27	1.6	.8	
			1.0	56	180	268	152	27	2.1	.8	
			1.0	152	152	238	126	16	2.6	.8	
			1.0	152	152	208	126	16	2.2	.8	
			1.0	152	126	180	126	7.0	1.1	.4	
			1.0	126	180	180	100	7.0	1.2	.2	
			1.0	77	2,230	152	100	7.0	1.5	.07	
			1.0	73	976	152	100	7.0	1.2	.03	
			1.0	1,360	678	126	100	7.0	1.2		
		0.6	1.0	466	501	126	77	.6	1.2		
	180	.2	1.0	300	466	126	77	2.6	1.1		
	41	.2	1.0	1,670	332	126	77	1.1	1.1		
	16	.6	1.0	607	268	126	56	1.5	1.1		
	1.1	.6	2.6	365	431	100	56	1.6	1.1		
	.6	.6	16	268	431	607	56	1.7	1.1		
	180	.6	27	208	2,340	752	56	1.7	.8		
	180	.6	16	180	1,670	397	56	1.6	.8		
	77	.6	16	152	1,070	332	56	1.6	.8		
	27	.6	16	238	2,110	268	41	1.7	.8		0.07
	7.0	.6	16	238	1,880	268	41	1.7	.8		.2
	2.6	.6	16	1,560	1,670	208	41	1.6	.8		.2
	.6	.6	16	607	1,070	238	41	1.6	.8		.2
		.6	7.0	1,670	752	238	41	1.6	.8		.2
		.6	7.0	883	752	208	41	1.6	.8		.07
		.6	2.6	607	1,360	180	41	1.6	.8		
		.6	2.6		1,160	180	41	1.7	.8		
		.6	2.6		789		41		.8		

7.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
5.											
			0.07	56	77	41	332	41	27	0.4	0.07
			.07	41	136	41	268	56	27	.4	.07
			.07	27	501	41	208	126	27	.4	.07
			.07	16	397	41	180	77	27	.3	.07
			.07	16	572	41	152	56	16	.3	.07
			.07	7.0	431	27	126	56	16	.2	.07
			.07	7.0	300	27	126	100	16	.1	.07
			.07	2.6	208	27	126	365	16	.1	.07
			.07	152	180	27	100	238	7.0	.07	.07
			.07	152	126	27	77	180	7.0	.07	.07
	0.2		.07	77	126	16	77	152	7.0	.07	.03
	.2		.2	41	100	16	77	126	7.0	.07	.03
			.6	27	77	397	77	77	7.0	.03	.03
			.6	27	56	678	77	77	7.0	.03	.03
			.2	16	38	332	56	77	2.6	.03	.03
			.07	27	56	268	77	56	2.6	.03	.03
			.07	56	100	397	77	56	2.6	.03	.03
				41	180	501	77	56	2.6	.03	.03
				41	126	1,880	100	41	2.6	.03	.03
				41	100	1,160	100	41	2.6	.03	.03
				41	152	678	100	41	1.5	.03	.03
				100	152	501	77	41	.9	.03	.03
			.07	100	126	394	56	41	.6	.03	.03
			.2	77	77	300	56	27	.6	.03	.03
			.2	100	77	238	56	27	.6	.03	.03
			.2	77	56	238	56	27	.6	.07	.03
		0.2	.2	77	56	208	56	56	.6	.07	.03
		.2		56	56	152	41	41	.5	.07	
		.1		41		1,070	41	41	.4	.07	
		.1		41		607	41	41	.4	.07	
				56		480		27		.07	

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Daily discharge, in second-feet, of Alameda Creek at Sunolglen, Cal., for the years end Sept. 30, 1901–1914—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Se
1905–6.												
1	.....	0.03	0.07	0.2	77	418	3,120	169	91	27	2.2	
2	.....	.03	.07	.1	77	332	1,570	169	81	23	2.2	
3	.....	.03	.03	.07	77	256	1,100	157	91	23	2.2	
4	.....	.03	.03	.07	77	1,440	767	157	100	16	2.2	
5	.....	.....	.03	.07	56	775	621	147	91	16	2.2	
6	.....	.....	.03	.07	56	557	508	147	91	12	2.4	
7	.....	.....	.03	.07	56	397	452	136	81	12	2.4	
8	.....	.....	.03	.07	56	345	411	136	72	12	2.6	
9	.....	.....	.03	.2	56	306	378	126	81	12	2.4	
10	.....	.....	.03	.2	56	226	345	126	56	12	2.4	
11	.....	.....	.03	.6	56	256	306	126	56	12	2.4	
12	.....	.....	.03	1.5	56	2,260	274	116	56	8.8	2.6	
13	.....	.....	.03	975	41	1,520	268	116	56	8.8	2.4	
14	.....	.....	.03	5,130	56	1,110	256	116	56	8.8	2.4	
15	.....	.....	.03	1,250	152	5,350	238	116	56	8.8	2.2	
16	.....	.....	.03	1,770	126	2,310	214	100	64	8.8	2.0	
17	.....	.....	.07	3,200	100	1,530	202	100	56	8.8	1.7	
18	.....	.....	.2	2,900	77	1,000	205	100	50	8.8	1.5	
19	.....	.....	.2	7,030	501	708	180	91	50	8.8	1.4	
20	.....	.03	.6	2,230	180	593	226	91	44	8.8	1.4	
21	.....	.03	.4	883	2,000	557	202	91	44	1.7	1.2	
22	.....	.03	.2	572	1,770	542	202	81	38	.8	1.1	
23	.....	.03	.07	431	1,070	473	332	81	38	.8	1.1	
24	.....	.03	.07	300	1,070	4,720	232	76	33	.7	.9	
25	.....	.03	.07	238	1,360	2,370	214	110	33	.7	.6	
26	.....	.03	.07	208	678	1,880	197	180	33	.7	.5	
27	.....	.03	.07	180	607	1,400	238	180	33	.9	.5	
28	.....	.03	.1	152	572	957	220	214	33	1.7	.5	
29	0.03	.03	.1	126	.....	1,590	197	214	33	1.7	.3	
30	.03	.07	.1	152	.....	693	180	147	33	1.7	.3	
31	.03	.....	.2	100	.....	6,650	.....	116	.....	17	.3	....
1906–7.												
1	0.3	.....	0.5	378	656	214	957	169	50	23	23	
2	.2	.....	.7	268	2,570	214	809	157	50	23	12	
3	.2	.....	.7	352	2,250	202	722	147	50	23	6.1	
4	.2	.....	.7	214	1,070	214	635	169	47	23	6.1	
5	.....	.....	.7	268	808	306	614	180	47	23	6.1	
6	.....	.....	.7	256	657	306	572	169	44	23	6.1	
7	.....	.....	.7	447	536	294	529	157	44	23	6.1	
8	.....	.....	.7	868	459	281	473	147	44	27	6.1	
9	.....	.....	.7	3,880	389	1,660	445	136	44	33	4.4	
10	.....	.....	.9	2,360	365	2,620	411	126	44	33	180	
11	.....	.....	2,730	1,470	332	2,620	385	126	44	33	33	
12	.....	.....	1,090	845	306	1,990	358	126	44	33	12	
13	.....	.....	601	864	262	1,320	345	121	50	33	6.1	
14	.....	.....	298	957	250	938	332	110	56	33	4.4	
15	.....	.....	175	1,080	226	707	411	100	50	44	4.4	
16	.....	.....	136	794	250	2,780	358	91	50	33	2.6	
17	.....	.....	91	1,790	226	3,920	319	91	50	33	2.6	
18	.....	.....	72	1,240	214	5,010	306	81	41	33	2.6	
19	.....	.....	56	901	191	10,900	281	91	33	33	2.6	
20	.....	.....	50	827	180	6,140	250	81	38	33	2.6	
21	.....	.....	44	920	226	3,880	226	81	38	33	2.6	
22	.....	.....	38	994	345	2,560	202	91	35	33	2.6	
23	.....	.....	44	1,040	378	10,700	202	81	33	33	2.6	
24	.....	.....	56	2,220	294	7,920	191	72	33	33	2.6	
25	.....	.....	536	2,340	306	6,690	191	72	33	33	2.6	
26	.....	.....	1,490	1,530	294	3,860	191	64	30	33	2.6	
27	.....	.....	950	1,600	250	2,600	191	56	27	23	2.6	
28	.....	.....	466	1,870	226	1,930	180	56	25	23	2.6	
29	.....	.....	306	1,270	.....	1,506	180	50	25	23	2.6	
30	.....	0.9	202	883	.....	1,290	169	50	23	23	2.6	
31	.....	.....	508	650	.....	586	.....	50	.....	23	2.6	....

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aily discharge, in second-feet, of Alameda Creek at Sunolglen, Cal., for the years ending Sept. 30, 1901–1914—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1907–8.												
1	0.9	2.0	6.1	345	246	758	44	12	1.7	0.7	0.3	0.5
2	1.2	2.0	6.1	180	900	542	44	12	1.7	.7	.3	.5
3	1.4	2.0	6.1	110	1,170	508	44	110	.7	.7	.3	.5
4	1.7	2.6	6.1	185	650	358	38	12	.7	.7	.3	2.2
5	1.9	2.6	6.1	136	411	332	38	12	.7	.7	.3	6.1
6	1.9	2.6	6.1	100	250	371	38	12	.7	.7	.3	.7
7	1.7	2.6	6.1	72	226	332	38	12	.7	.7	.3	.7
8	1.7	2.6	38	56	202	294	35	12	.7	.7	.3	.7
9	1.7	2.6	38	56	404	250	35	12	.7	.7	.3	.6
10	1.4	2.6	38	50	358	191	32	12	.7	.7	.6	.6
11	1.4	2.6	281	38	214	157	30	8.8	.7	.7	.3	.6
12	1.4	2.6	91	38	202	147	30	8.8	.7	.7	.3	.6
13	1.4	2.6	56	33	180	121	27	8.8	.7	.7	.3	.6
14	1.2	12	56	867	157	100	27	12	1.2	.7	.3	.6
15	1.2	12	56	349	136	91	27	12	.9	.7	.3	.6
16	2.6	12	56	226	110	81	25	12	.7	.7	.3	.6
17	2.6	12	44	157	91	81	25	8.8	.7	.7	.5	.6
18	1.9	12	44	126	81	72	23	8.8	.5	.7	.5	.5
19	1.7	12	44	100	64	64	16	8.8	.5	.7	.5	.5
20	1.7	12	33	91	72	56	16	8.8	.7	.7	.5	.5
21	2.6	12	33	136	64	56	16	8.8	.7	.6	.5	.5
22	2.6	12	33	136	64	50	16	8.8	.7	.6	.5	.5
23	2.6	12	27	167	56	50	23	8.8	.7	.6	.3	.5
24	1.7	12	27	332	50	44	23	8.8	.7	.6	.3	.5
25	1.7	12	27	688	50	44	23	8.8	.7	.6	.3	.5
26	2.6	12	27	883	44	44	18	8.8	.7	.6	.3	.3
27	2.6	12	27	444	44	44	18	6.1	.7	.6	.3	.3
28	2.6	8.8	33	332	134	44	16	6.1	.7	.5	.3	.2
29	4.4	8.8	27	232	356	44	16	6.1	.7	.5	.3	.2
30	6.1	6.1	303	226	.....	44	14	6.1	.7	.5	.3	.2
31	2.2	.....	818	202	.....	44	.....	6.1	.....	.5	.3	.....
1908–9.												
1	0.2	0.2	0.9	0.9	501	294	397	23	8.8	4.4	0.2	0.03
2	.2	.2	.9	.9	539	250	293	23	6.1	4.4	.07	.03
3	.2	.2	.9	.9	3,480	226	238	23	6.1	4.4	.03	.03
4	.2	.2	.9	.9	2,020	250	202	16	6.1	4.4	.03	.03
5	.2	.5	.9	.9	811	226	180	16	6.1	4.4	.03	.03
6	.2	.6	.9	.9	794	494	136	16	6.1	4.4	.03	.03
7	.2	.5	.9	1.2	4,910	707	116	16	6.1	4.4	.03	.03
8	.2	.5	.9	920	5,800	480	91	16	6.1	4.4	.....	.03
9	.2	.5	.9	905	1,920	385	147	16	6.1	4.4	.....	.03
10	.2	.3	.9	501	1,360	306	72	16	6.1	4.4	.....	.03
11	.2	.3	.9	72	4,790	250	56	16	6.1	4.4	.....	.03
12	.2	.3	1.1	737	5,700	226	50	12	6.1	4.4	.....	.03
13	.2	.2	1.1	5,090	3,800	180	44	12	6.1	4.4	.....	.03
14	.2	.2	1.1	4,220	2,130	157	38	12	6.1	4.4	.....	.03
15	.2	.3	1.1	2,110	1,700	157	33	12	6.1	6.1	.....	.03
16	.2	.5	1.2	2,240	1,110	136	44	12	6.1	6.1	.....	.03
17	.2	.5	1.2	1,350	845	110	16	12	4.4	4.4	.....	.03
18	.2	.5	1.2	529	737	91	23	12	4.4	4.4	.....	.03
19	.2	.2	1.2	332	621	81	23	12	4.4	4.4	.....	.03
20	.2	.2	1.2	3,210	1,840	91	23	12	4.4	1.7	.....	.03
21	.2	.2	1.7	10,600	1,880	411	23	12	4.4	1.7	.....	.07
22	.2	.2	4.4	4,870	957	501	16	8.8	4.4	33	.....	.2
23	.2	.5	2.6	2,720	808	180	16	8.8	4.4	4.4	.....	.3
24	.2	.5	1.9	1,360	621	180	16	8.8	4.4	4.4	.....	.5
25	.2	.7	1.7	4,130	529	845	16	8.8	4.4	4.4	.03	.7
26	.2	.7	1.4	4,010	411	557	27	8.8	4.4	4.4	.03	.9
27	.2	.9	1.2	1,980	358	445	23	8.8	4.4	1.7	.03	.9
28	.2	.9	1.2	1,040	319	332	23	8.8	4.4	.7	.03	.9
29	.2	.9	1.2	784	.....	1,270	23	8.8	4.4	.7	.03	.9
30	.2	.9	.9	678	.....	650	23	8.8	4.4	.5	.03	.9
31	.2	.....	.9	678	.....	459	.....	8.8	.....	.5	.03	.....

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Daily discharge, in second-feet, of Alameda Creek at Sunolglen, Cal., for the years ende Sept. 30, 1901–1914—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Se
1909.												
1.....	0.1	0.1	1.3	1,450	293	214	262	50	8.8	4.4	3.5	
2.....	1.1	.9	1.7	501	250	147	250	50	8.8	4.4	3.5	
3.....	1.1	.9	4.4	306	214	147	226	50	8.8	4.4	3.5	
4.....	1.1	.9	4.4	169	191	136	214	44	8.8	4.4	3.5	
5.....	.9	.9	96	110	169	136	180	44	6.1	4.4	1.7	
6.....	.9	1.2	38	72	157	126	169	44	6.1	4.4	1.7	
7.....	.9	1.2	33	56	872	116	126	38	6.1	3.5	1.4	
8.....	.8	1.2	33	56	445	100	136	38	6.1	3.5	1.4	
9.....	.8	1.7	1,710	50	345	116	126	38	6.1	3.5	1.4	
10.....	.7	1.7	385	44	332	91	126	38	6.1	3.5	1.4	
11.....	.7	1.7	110	44	281	91	147	38	4.4	3.5	1.2	
12.....	.7	4.4	72	38	256	91	157	33	4.4	3.5	1.1	
13.....	.6	4.4	44	33	226	81	126	33	4.4	3.5	.9	
14.....	.5	1.7	33	550	202	126	116	33	4.4	3.5	.9	
15.....	.5	1.2	23	1,330	191	126	105	33	4.4	3.5	.9	
16.....	.7	1.2	16	1,500	169	116	81	33	6.1	3.5	.8	
17.....	.7	1.1	12	1,060	157	100	72	27	6.1	3.5	.8	
18.....	.9	1.1	12	621	157	91	72	27	6.1	3.5	.8	
19.....	.9	1.2	8.8	459	358	91	72	23	6.1	3.5	.8	
20.....	1.2	1.3	8.8	371	281	136	72	23	5.2	3.5	.8	
21.....	8.8	1.3	8.8	306	226	250	64	16	5.2	3.5	.8	
22.....	6.1	1.4	8.8	319	214	827	56	23	6.1	3.5	.8	
23.....	6.1	1.4	8.8	319	226	957	50	23	6.1	3.5	.8	
24.....	6.1	1.4	8.8	2,340	214	643	50	23	6.1	3.5	.8	
25.....	1.4	1.4	8.8	1,530	238	501	50	16	4.4	3.5	.8	
26.....	1.4	1.4	8.8	920	214	657	50	16	4.4	3.5	.8	
27.....	1.2	1.3	8.8	808	191	473	50	12	4.4	3.5	.8	
28.....	.9	1.3	8.8	586	180	657	50	12	4.4	3.5	.8	
29.....	.7	1.2	8.8	473	.....	459	50	12	4.4	3.5	.8	
30.....	.7	1.2	23	385	.....	358	50	12	4.4	3.5	.8	
31.....	.7	.....	2,060	319	.....	385	.....	8.8	.....	3.5	.8	....
1910.												
1.....	0.6	.....	1.2	0.7	2,260	385	191	50	6.1	4.4	4.4	
2.....	.6	.....	1.2	.7	1,320	767	180	50	6.1	4.4	4.4	
3.....	.6	.....	1.2	.7	1,640	3,730	169	50	6.1	4.4	4.4	
4.....	.6	.....	1.2	.7	1,570	2,990	157	50	6.1	4.4	4.4	
5.....	.6	.....	1.2	.7	939	5,690	202	50	6.1	4.4	4.4	
6.....	.6	.....	1.2	.7	737	10,800	226	44	6.1	4.4	4.4	
7.....	.8	.....	1.2	.7	557	14,700	169	44	6.1	4.4	4.4	
8.....	.8	.....	1.2	.7	473	5,810	136	44	6.1	4.4	3.5	
9.....	.7	.....	1.2	.7	385	3,470	126	136	6.1	4.4	3.5	
10.....	.7	.....	1.2	.7	345	3,070	126	44	6.1	4.4	3.5	
11.....	.7	.....	1.2	.7	1,100	2,260	116	33	6.1	4.4	3.5	
12.....	.8	.....	1.3	2,760	737	1,530	105	27	6.1	4.4	3.5	
13.....	.8	.....	1.4	5,170	2,420	1,190	91	27	6.1	4.4	3.5	
14.....	.02	.....	1.4	9,660	1,480	883	91	27	6.1	4.4	3.5	
15.....	.03	.....	1.4	3,010	1,320	722	81	23	6.1	4.4	3.5	
16.....	.....	.....	1.5	1,270	737	664	81	23	6.1	4.4	3.5	
17.....	.....	.....	1.4	586	501	572	72	23	6.1	4.4	3.5	
18.....	.....	.....	1.1	332	424	529	64	23	6.1	4.4	3.5	
19.....	.....	.....	1.1	332	358	473	64	23	6.1	4.4	3.5	
20.....	.....	.....	1.1	523	306	431	64	18	6.1	4.4	3.5	
21.....	.....	.....	1.1	332	262	385	64	12	6.1	4.4	3.5	
22.....	.03	.....	1.1	332	238	345	64	12	6.1	4.4	3.5	
23.....	.....	.....	1.1	332	214	300	56	12	4.4	4.4	3.5	
24.....	.....	1.3	.7	2,210	191	294	56	12	4.4	4.4	3.5	
25.....	.....	1.2	.7	2,720	180	262	56	12	4.4	4.4	3.5	
26.....	.....	1.3	.7	2,190	169	238	56	12	4.4	4.4	3.5	
27.....	.....	1.2	.7	1,360	157	226	64	12	4.4	4.4	4.4	
28.....	.....	1.2	.7	2,580	157	214	64	8.8	4.4	4.4	3.5	
29.....	.....	1.2	.7	4,700	.....	208	56	8.8	4.4	4.4	3.5	
30.....	.....	1.2	.7	4,440	.....	202	56	6.1	4.4	4.4	3.5	
31.....	.....	.....	.7	2,890	.....	202	.....	6.1	.....	4.4	3.5	....

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Daily discharge, in second-feet, of Alameda Creek at Sunolglen, Cal., for the years ending Sept. 30, 1901–1914—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1911–12.										
1	2.0	1.7	4.4	4.4	50	12	27	12	1.5	0.03
2	2.0	1.7	4.4	6.1	44	12	27	12	1.2	.....
3	2.0	2.2	4.4	6.1	38	12	23	12	1.1	.....
4	2.0	2.2	4.4	6.1	35	12	16	8.8	.4	.....
5	2.0	2.2	4.4	4.4	33	12	16	8.8	.3	.....
6	2.0	2.2	4.4	4.4	27	20	12	8.8	.3	.....
7	2.0	2.2	4.4	4.4	27	306	8.8	6.1	.3	.....
8	2.0	2.2	4.4	4.4	27	126	6.1	6.1	.2	.....
9	2.0	2.2	4.4	4.4	27	72	12	4.4	.2	.....
10	2.0	2.2	4.4	4.4	27	44	4.4	4.4	.1	.....
11	2.0	2.6	4.4	4.4	27	33	38	4.4	.1	.....
12	2.0	2.6	2.6	4.4	27	33	157	3.5	.1	.....
13	2.0	2.6	2.6	4.4	27	722	126	3.5	.1	.....
14	1.7	2.6	2.6	4.4	27	459	91	3.5	.1	.....
15	1.7	2.4	2.6	4.4	27	332	56	3.5	.1	.....
16	1.7	2.4	2.6	4.4	27	678	38	8.8	.07	.....
17	1.7	2.6	2.6	4.4	27	332	27	7.0	.07	.....
18	1.7	2.6	2.6	4.4	25	202	27	1.9	.07	.....
19	1.7	2.6	2.6	5.2	25	169	23	1.1	.07	.....
20	1.7	2.6	2.6	5.2	25	100	23	1.7	.07	.....
21	1.7	2.6	2.6	5.2	25	91	16	2.0	.05	.....
22	1.7	2.6	2.6	5.2	25	72	12	2.0	.05	.....
23	1.7	2.6	2.6	5.2	25	50	8.8	2.1	.05	.....
24	1.7	2.6	2.6	5.2	25	38	8.8	2.1	.2	.....
25	1.7	2.6	2.6	5.2	25	33	8.8	2.2	.1	.....
26	1.7	4.4	2.6	808	25	33	8.8	2.2	.07	.....
27	1.7	4.4	2.6	715	25	33	8.8	8.8	.07	.....
28	1.7	4.4	4.4	202	12	27	8.8	6.1	.05	.....
29	1.7	4.4	4.4	126	12	27	8.8	2.6	.05	.....
30	1.7	4.4	4.4	72	.....	27	8.8	1.8	.03	.....
31	1.7	.....	4.4	56	.....	20	.....	1.6	.....	.....

Day.	Jan.	Feb.	Mar.	Apr.	Day.	Jan.	Feb.	Mar.	Apr.
1912–13.					1912–13.				
1	.....	5.2	2.2	2.6	16	208	1.2	1.2	.2
2	.....	2.2	5.2	2.6	17	445	1.2	1.2	.2
3	.....	1.9	5.2	.6	18	918	1.2	1.7	.2
4	.....	2.1	5.2	.5	19	487	1.2	1.3	.1
5	.....	1.2	5.2	.5	20	131	1.1	1.4	.02
6	.....	1.1	5.2	.3	21	41	1.2	1.4	.02
7	.....	1.1	5.2	.2	22	16	1.1	2.6	.02
8	.....	1.3	5.2	.2	23	11	1.1	69	.03
9	.....	1.5	5.2	.2	24	53	1.2	86	.03
10	.....	1.5	5.2	.2	25	44	6.1	69	.03
11	.....	1.6	1.2	.2	26	30	6.1	56	.03
12	.....	1.5	1.2	.2	27	20	6.1	44	.02
13	.....	1.4	1.2	.2	28	16	5.2	23	.02
14	.....	1.3	1.2	.2	29	7.0	.....	20	.02
15	293	1.2	1.1	.2	30	7.0	.....	14	.02
					31	52	.....	5.2	.....

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Daily discharge, in second-feet, of Alameda Creek at Sunolglen, Cal., for the years ending Sept. 30, 1901–1914—Continued.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1913–14.									
1		4,100	397	404	56	7.0	1.5	0.5	0.1
2		1,950	332	352	41	7.0	1.5	.5	
3		861	287	306	56	7.0	1.5	.4	
4		543	244	262	100	7.0	1.5	.4	
5		306	238	238	77	7.0	1.5	.4	
6		191	191	220	56	7.0	1.5	.3	
7		131	169	202	41	7.0	1.5	.3	
8		180	147	180	56	2.2	1.4	.2	
9		116	136	180	100	2.2	1.4	.2	
10		86	136	147	77	2.2	1.3	.1	
11		68	100	136	56	2.2	1.3	.1	
12		56	105	131	41	2.2	1.2	.1	
13		988	95	131	41	2.2	1.2	.1	
14		2,860	86	126	41	2.2	1.2	.1	
15		1,530	77	105	41	2.2	1.2	.1	
16		782	77	95	41	1.8	1.1	.1	
17		458	91	86	27	1.8	1.1	.1	
18		1,860	110	77	16	1.8	1.0	.1	
19		1,210	2,190	56	16	1.8	.9	.1	
20		754	7,620	53	16	1.7	.9	.1	
21		5,630	4,560	47	16	1.7	.9	.1	
22	728	3,260	2,760	44	16	1.6	.8	.1	
23	262	3,970	1,890	44	16	1.5	.8	.1	
24	116	6,520	1,190	41	16	1.5	.7	.1	
25	53	8,200	948	41	16	1.5	.6	.1	
26	300	2,920	715	27	16	1.5	.6	.1	
27	110	1,390	564	27	16	1.5	.6	.1	
28	50	917	466	56	16	1.5	.6	.1	
29	30	656	.....	100	16	1.5	.5	.1	
30	41	501	.....	77	16	1.5	.5	.1	
31	3,730	431	.....	56	.....	1.5	.....	.1	.....

NOTE.—No flow over dam Aug. 20 to Nov. 18, 1901; Aug. 19 to Nov. 9, 1902; July 12 to Nov. 14 and Nov. to Dec. 13, 1903; Aug. 13 to Sept. 22, Sept. 29 to Oct. 10, Oct. 13 to Nov. 26, Dec. 18–22 and Dec. 27–31, 1904; Aug. 28 to Oct. 28 and Nov. 4–19, 1905; Oct. 5 to Nov. 29, 1906; Aug. 8–24, 1909; Oct. 16–21, Oct. 28 to Nov. 23, 1910; July 2, 1912, to Jan. 14, 1913; May 1 to Dec. 21, 1913, and Aug. 2 to Sept. 30, 1914.

Monthly discharge of Alameda Creek at Sunolglen, Cal., for the years ending Sept. 30, 1901–1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1900–1901.				
October 4–31	17	9.4	10.9	605
November	8,260	11	391	23,300
December	179	15	52.1	3,200
January	1,130	31	282	17,300
February	3,840	70	993	55,100
March	378	79	161	9,900
April	180	39	66.0	3,900
May	229	34	57.8	3,500
June	30	20	23.1	1,370
July	18	2.0	9.31	572
August	7.6	.0	2.57	158
September	.0	.0	.0	0
The period	8,260	.0	164	119,000
1901–2.				
October	.0	.0	.0	0
November	1.7	.0	.52	31
December	125	1.7	17.4	1,070
January	16	6.5	7.11	437
February	2,760	6.5	521	28,900
March	4,130	125	685	42,100
April	299	56	127	7,560
May	56	27	39.3	2,420
June	27	4.6	14.7	875
July	7.8	4.6	5.03	309
August	7.8	.0	2.29	141
September	.0	.0	.00	0
The year	4,130	.0	116	83,800

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Monthly discharge of Alameda Creek at Sunolglen, Cal., for the years ending Sept. 30, 1901–1914—Continued.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1902–3.				
October	0.0	0.0	0.0	0
November	100	.0	5.42	323
December	2.6	.07	.730	45
January	3,490	1.5	267	16,400
February	1,880	41	329	18,300
March	6,680	41	677	41,600
April	5,270	77	519	30,900
May	77	16	38.9	2,390
June	16	.07	3.36	200
July	7.0	.0	.958	59
August	.0	.0	.0	0
September	.0	.0	.0	0
The year	6,680	.0	152	110,000
1903–4.				
October	.0	.0	.0	0
November	180	.0	23.8	1,420
December	.6	.0	.32	20
January	27	1.0	5.83	358
February	1,670	2.0	420	24,200
March	2,340	126	812	49,900
April	752	100	273	16,200
May	208	41	90.1	5,540
June	41	.6	9.00	536
July	2.6	.8	1.22	75
August	.8	.0	.229	14
September	.2	.0	.031	2
The year	2,340	.0	135	98,300
1904–5.				
October	.2	.0	.01	1
November	.2	.0	.02	1
December	.6	.0	.103	6
January	152	2.6	52.8	3,250
February	572	38	166	9,220
March	1,880	16	350	21,500
April	332	41	102	6,070
May	365	27	79.5	4,890
June	27	.4	7.88	469
July	.4	.03	.106	7
August	.07	.0	.039	2
September	.0	.0	.0	0
The year	1,880	.0	62.8	45,400
1905–6.				
October	.03	.0	.003	.2
November	.07	.0	.016	1
December	.6	.03	.099	6
January	7,030	.07	898	55,200
February	2,000	41	397	22,000
March	6,650	226	1,400	86,100
April	3,120	180	462	27,500
May	214	76	130	7,990
June	100	33	57.7	3,430
July	27	.7	9.18	564
August	2.6	.3	1.63	100
September	1.2	.5	.87	52
The year	7,030	.0	281	203,000
1906–7.				
October	.3	.0	.03	2
November	.9	.0	.03	2
December	2,370	.5	321	19,700
January	3,880	214	1,140	70,100
February	2,570	180	518	28,800
March	10,900	202	2,780	171,000
April	957	169	381	22,700
May	180	50	106	6,520
June	56	23	41.0	2,440
July	44	23	29.3	1,800
August	180	2.6	11.5	707
September	2.6	.8	1.86	111
The year	10,900	.0	447	324,000

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Monthly discharge of Alameda Creek at Sunolglen, Cal., for the years ending Sept. 30, 1901–1914—Continued.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1907–8.				
October	6.1	0.9	2.07	127
November	12	2.0	7.46	444
December	818	6.1	74.2	4,560
January	883	33	229	14,100
February	1,170	44	241	13,900
March	758	44	175	10,800
April	44	14	27.2	1,620
May	110	6.1	12.9	793
June	1.7	.5	.78	46
July	.7	.5	.65	40
August	.6	.3	.35	22
September	6.1	.2	.75	45
The year	1,170	.2	63.9	46,500
1908–9.				
October	.2	.2	.20	12
November	.9	.2	.44	26
December	4.4	.9	1.27	78
January	10,600	.9	1,780	109,000
February	5,800	319	1,830	102,000
March	1,270	81	352	21,600
April	397	16	80.9	4,810
May	23	8.8	13.1	806
June	8.8	4.4	5.40	321
July	33	.5	4.68	286
August	.2	.0	.020	1
September	.9	.03	.229	14
The year	10,600	.0	330	239,000
1909–10.				
October	8.8	.1	1.61	99
November	4.4	.1	1.44	86
December	2,060	1.3	155	9,530
January	2,340	33	552	33,900
February	872	157	259	14,400
March	957	81	276	17,000
April	262	50	112	6,660
May	50	8.8	29.4	1,810
June	8.8	4.4	5.78	344
July	4.4	3.5	3.67	226
August	3.5	.8	1.32	81
September	.9	.5	.72	43
The year	2,340	.1	116	84,200
1910–11.				
October	.8	.0	.290	18
November	1.3	.0	.29	17
December	1.5	.7	1.09	67
January	9,660	.7	1,540	94,700
February	2,420	157	756	42,000
March	14,700	202	2,050	126,000
April	226	56	103	6,130
May	136	6.1	29.8	1,830
June	6.1	4.4	5.65	336
July	4.4	4.4	4.40	271
August	4.4	3.5	3.73	229
September	2.6	2.0	2.26	134
The year	14,700	.0	375	272,000
1911–12.				
October	2.0	1.7	1.83	113
November	4.4	1.7	2.72	162
December	4.4	2.6	3.47	213
January	808	4.4	67.7	4,160
February	50	12	27.5	1,580
March	722	12	134	8,240
April	157	4.4	28.6	1,700
May	12	1.1	5.03	309
June	1.5	.03	.239	14
July	.03	.0	.001	.1
August	.0	.0	.00	0
September	.0	.0	.00	0
The year	808	.0	22.7	16,500

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Monthly discharge of Alameda Creek at Sunolglen, Cal., for the years ending Sept. 30, 1901–1914—Continued.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1912–13.				
October	0.0	0.0	0.00	0
November	.0	.0	.00	0
December	.0	.0	.00	0
January	918	.0	89.6	5,510
February	6.1	1.1	2.15	119
March	86	1.1	14.6	898
April	2.6	.02	.329	20
May	.0	.0	.00	0
June	.0	.0	.00	0
July	.0	.0	.00	0
August	.0	.0	.00	0
September	.0	.0	.00	0
The year	918	.0	9.04	6,550
1913–14.				
October	.0	.0	.00	0
November	.0	.0	.00	0
December	3,730	.0	175	10,800
January	8,200	56	1,720	106,000
February	7,620	77	926	51,400
March	404	27	131	8,060
April	100	16	38.5	2,290
May	7.0	1.5	2.98	183
June	1.5	.5	1.08	64
July	.5	.1	.17	10
August	.1	.0	.003	.2
September	.0	.0	.00	0
The year	8,200	.0	247	179,000

NOTE.—Monthly and yearly discharge for all years computed by engineers of United States Geological Survey.

SPRING VALLEY WATER CO.'S AQUEDUCT NEAR SUNOLGLEN, CAL.

LOCATION.—In sec. 12, T. 4. S., R. 1 W., at Brightside weir, about 2½ miles west of Sunolglen.

RECORDS AVAILABLE.—April 6, 1903, to September 30, 1914.

GAGE.—Spring Valley water-stage recorder in pool above the weir.

DISCHARGE.—Computed from gage-height record showing head on four rectangular weirs; weir plates are made of bronze and have a 30-inch crest.

ACCURACY.—The weirs were very carefully installed and much care is exercised in their maintenance. There is no velocity of approach. When no record is obtained at the Brightside weir discharge is computed from record of operation of the Belmont pumps.

COOPERATION.—Records furnished in million gallons per day by the Spring Valley Water Co., through F. C. Herrmann, chief engineer, and G. A. Elliott, engineer; converted into second-feet and monthly discharge computed by engineers of United States Geological Survey.

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Daily discharge, in second-feet, of Spring Valley Water Co.'s aqueduct near Sunolglen, Cal., for the years ending Sept. 30, 1903–1914.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1903.							1903.						
1	.....	23	26	26	24	19.8	16	26	26	25	27	22	18.3
2	.....	23	26	27	24	19.4	17	26	25	25	27	22	18.3
3	.....	22	26	27	24	19.1	18	25	25	26	27	22	17.9
4	.....	23	26	27	24	19.1	19	25	26	26	27	22	17.9
5	.....	24	26	27	24	19.1	20	25	25	26	27	22	18.3
6	25	23	26	27	24	19.1	21	26	25	26	26	22	18.3
7	26	23	25	27	24	19.1	22	26	25	26	27	21	17.9
8	25	23	25	27	23	18.7	23	26	26	25	27	21	17.9
9	25	24	25	27	23	18.3	24	26	25	26	27	21	17.9
10	26	25	26	27	23	18.3	25	26	25	27	27	21	17.7
11	26	24	26	27	23	18.3	26	25	25	27	26	21	17.5
12	26	25	26	27	23	18.3	27	25	26	27	26	21	17.5
13	25	25	26	27	23	19.8	28	26	26	28	26	20	17.3
14	26	25	26	27	23	19.1	29	25	26	27	26	20	17.3
15	27	26	26	27	22	19.1	30	23	26	27	25	19.8	17.1
							31	.....	26	.....	25	19.8	.....

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1903–4.												
1	17.5	16.3	26	25	25	27	24	26	26	26	26	19.4
2	17.3	16.3	26	25	25	26	25	26	26	26	26	19.4
3	17.1	16.7	25	24	25	25	25	26	26	26	26	19.4
4	17.1	16.7	25	26	25	27	25	24	26	26	26	19.4
5	17.1	16.7	25	25	26	26	24	24	26	26	26	19.1
6	17.1	16.7	25	25	23	25	25	25	26	26	27	19.1
7	17.1	16.7	26	25	25	25	25	25	26	26	26	19.1
8	16.7	16.7	25	25	24	25	25	25	25	26	26	18.7
9	16.7	16.7	25	25	26	25	25	26	26	26	26	18.7
10	16.7	16.7	25	25	25	25	25	26	25	26	25	18.3
11	17.1	16.7	25	25	25	24	25	27	26	25	25	18.3
12	16.7	17.5	25	25	25	23	25	26	26	26	25	18.1
13	16.7	18.3	25	25	25	24	25	25	25	26	24	18.1
14	17.1	18.3	25	25	23	25	25	26	27	26	24	18.1
15	17.1	14.4	26	26	24	25	25	25	26	26	23	17.9
16	17.1	17.5	25	25	20	25	25	25	26	25	23	17.7
17	16.7	25	26	25	22	26	25	26	26	25	23	17.7
18	16.7	25	25	25	25	26	25	25	26	26	23	17.7
19	16.7	23	25	26	25	25	25	26	26	26	23	17.5
20	16.3	23	25	25	25	25	25	26	25	26	22	17.5
21	15.8	15.8	25	26	24	25	24	26	25	26	21	17.5
22	15.8	15.8	25	26	24	25	26	26	26	26	21	17.5
23	15.8	22	25	25	26	25	25	26	26	26	21	17.9
24	15.8	22	25	25	25	26	25	26	26	27	22	18.3
25	15.8	25	25	25	19.8	25	25	25	26	27	22	18.3
26	16.3	25	26	26	21	25	25	26	26	27	22	18.7
27	16.3	24	26	25	23	25	26	26	26	27	21	18.7
28	16.3	25	25	25	23	25	25	26	26	27	21	18.3
29	16.3	26	25	25	25	25	26	26	26	26	21	17.9
30	16.3	27	25	25	.....	25	25	26	26	27	20	17.9
31	16.3	.....	25	25	.....	25	.....	26	.....	27	19.8	.....

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arge, in second-feet, of Spring Valley Water Co.'s aqueduct near Sunolglen, Cal. for the years ending Sept. 30, 1903–1914—Continued.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
....	17.9	19.1	19.8	16.7	26	25	24	25	26	27	27	18.1
....	17.7	19.1	19.8	19.8	25	25	23	25	26	27	26	18.1
....	17.5	19.1	19.8	21	23	25	23	25	26	27	27	18.1
....	17.5	19.1	19.8	21	22	25	24	25	26	27	26	18.1
....	17.5	19.1	19.8	23	22	25	24	25	26	27	27	18.1
....	17.5	19.1	19.8	23	22	25	25	25	26	27	26	17.9
....	17.5	19.1	19.8	23	21	25	27	25	26	27	25	17.7
....	17.5	19.1	19.8	23	21	25	26	24	26	26	25	17.7
....	17.5	19.1	19.8	25	19.8	25	25	25	26	25	24	17.5
....	18.3	19.1	19.8	25	23	25	26	25	26	24	24	17.3
....	18.7	19.1	20	25	23	26	25	25	26	24	24	17.1
....	19.4	19.1	21	25	25	25	25	25	26	24	23	16.9
....	19.1	19.1	21	25	25	23	26	27	26	24	23	16.7
....	18.7	19.4	20	25	24	23	25	26	26	24	23	16.7
....	18.3	19.4	19.8	25	25	25	26	26	26	25	23	16.5
....	18.3	19.4	19.8	24	25	25	25	26	26	25	23	16.3
....	18.3	19.4	19.8	25	26	24	25	26	26	25	22	16.1
....	18.3	19.8	20	25	25	25	25	25	25	25	22	15.8
....	18.3	19.8	20	25	25	26	25	26	26	27	22	15.8
....	18.3	19.8	20	25	25	25	25	26	27	27	21	15.7
....	18.3	19.8	20	25	25	25	25	26	26	27	21	15.5
....	17.9	19.8	20	25	25	24	26	25	26	27	21	15.5
....	17.9	19.8	20	26	25	23	26	26	26	27	20	15.3
....	17.9	19.8	20	25	25	22	26	26	26	27	20	15.5
....	17.9	19.8	21	25	25	23	25	27	26	27	20	15.5
....	18.3	19.8	21	25	25	24	25	26	27	20	19.8	15.3
....	18.3	19.8	21	25	25	24	25	25	27	17.1	19.6	15.3
....	18.7	19.8	21	25	25	25	25	26	27	27	19.4	15.1
....	18.3	19.8	21	25	.....	24	25	26	27	27	19.1	14.9
....	18.7	19.8	21	25	.....	22	25	26	27	27	19.1	14.9
....	19.1	.....	23	26	.....	24	.....	26	.....	27	18.7	.....
....	14.9	14.0	14.8	14.4	22	24	27	5.4	20	23	24	24
....	14.9	14.0	14.8	14.1	23	24	27	5.4	20	23	24	24
....	14.8	14.0	14.8	14.0	24	24	27	5.4	19.9	23	24	24
....	14.8	14.0	14.4	11.5	26	25	27	5.4	19.9	23	23	24
....	14.4	14.0	14.1	11.5	26	24	27	5.4	20	23	24	24
....	14.4	13.8	14.0	11.5	26	24	27	5.4	20	23	24	24
....	14.4	13.8	14.0	14.0	25	25	27	5.4	20	23	24	24
....	14.4	13.8	13.8	14.4	25	26	27	5.4	19.9	23	24	24
....	14.2	13.8	13.8	14.6	25	26	27	5.4	21	22	24	25
....	14.0	13.8	13.8	14.8	25	26	27	5.4	19.9	22	24	26
....	14.0	13.8	13.8	14.8	25	26	27	5.4	20	23	23	27
....	14.0	13.8	13.8	14.8	25	26	27	5.4	19.9	23	24	26
....	14.0	13.8	13.8	19.1	25	19.8	27	5.4	19.9	22	24	26
....	14.0	13.8	14.0	19.8	25	24	27	5.4	21	23	23	26
....	13.8	13.6	14.0	19.4	25	24	27	5.4	20	22	24	26
....	13.8	13.6	14.0	18.7	27	26	27	5.4	21	23	24	26
....	14.0	13.6	14.1	18.7	25	25	27	5.4	20	22	24	26
....	14.0	13.6	14.4	19.1	25	25	24	5.4	20	22	25	26
....	13.8	13.6	14.8	23	26	26	2.8	5.4	20	22	26	26
....	13.8	13.6	14.8	21	27	26	4.7	14.6	21	23	26	24
....	13.8	13.6	14.8	19.8	25	26	6.9	14.8	21	22	27	25
....	13.8	13.6	14.8	23	25	26	11.0	15.2	20	23	27	25
....	14.0	13.6	14.8	22	25	26	1.9	18.6	21	24	27	25
....	14.0	13.8	14.4	21	24	23	2.0	19.7	21	24	27	25
....	14.0	13.8	14.0	21	27	24	5.1	20	23	24	26	25
....	14.0	13.8	14.0	21	26	25	3.1	20	24	24	26	25
....	14.0	13.8	14.0	21	25	25	3.1	20	23	24	26	26
....	14.0	14.0	14.4	21	24	26	3.2	19.9	23	24	26	25
....	14.0	14.4	14.0	22	.....	26	5.0	20	23	24	25	24
....	14.0	14.6	14.0	22	.....	26	6.2	19.9	23	23	25	24
....	14.0	.....	14.0	22	.....	27	.....	20	.....	24	24	.....

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Daily discharge, in second-feet, of Spring Valley Water Co.'s aqueduct near Sunolglen, Cal., for the years ending Sept. 30, 1903–1914—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1906–7.												
1	24	22	23	18.4	26	27	26	27	27	27	29	27
2	24	22	22	24	25	26	26	28	27	27	29	27
3	24	22	22	25	23	26	26	28	27	26	29	27
4	24	22	22	24	24	26	26	27	27	27	29	27
5	24	23	22	19.9	25	26	26	28	27	27	28	27
6	24	24	22	24	26	26	26	27	27	27	28	26
7	24	23	22	23	26	26	26	28	27	27	27	26
8	24	23	22	20	26	26	26	27	27	27	27	27
9	23	22	23	18.7	26	26	26	27	27	27	27	27
10	23	22	23	19.8	26	24	26	26	27	23	27	26
11	23	22	23	22	26	24	26	27	27	22	27	27
12	23	22	14.5	25	26	26	26	27	27	22	26	27
13	23	22	15.8	26	26	25	26	27	27	24	26	26
14	23	22	23	25	26	26	26	27	27	24	26	27
15	23	22	23	24	26	26	26	26	27	27	27	26
16	23	22	19.3	25	26	26	26	27	26	25	27	26
17	23	22	22	25	26	25	26	27	28	27	27	26
18	22	22	20	23	26	24	26	27	27	26	27	27
19	23	22	19.9	23	26	25	26	27	27	27	27	27
20	26	22	19.8	25	26	14.1	26	27	27	27	27	27
21	26	22	19.9	25	26	13.7	26	27	27	27	27	27
22	22	21	21	25	26	25	26	27	27	28	27	27
23	22	22	23	25	25	26	26	27	27	29	27	27
24	22	22	23	26	25	2.3	26	27	27	29	27	27
25	22	22	23	25	25	.9	27	27	28	29	27	27
26	22	22	24	21	26	.9	27	27	27	28	27	26
27	22	22	27	23	26	.9	28	27	27	28	27	26
28	22	22	17.4	23	27	.9	27	27	27	28	27	26
29	22	22	24	23	.....	.9	28	27	27	28	27	25
30	22	21	25	25	.....	.9	27	27	27	28	27	25
31	22	.....	25	26	.....	9.8	.....	27	.....	29	27	.....
1907–8.												
1	25	26	25	25	23	25	26	26	24	27	22	19.0
2	25	26	24	25	26	26	26	26	26	28	21	18.7
3	26	27	25	23	26	25	26	26	27	27	20	18.5
4	26	26	25	22	26	25	26	26	27	27	18.5	18.5
5	26	26	25	22	25	24	26	26	28	27	19.8	19.8
6	26	26	25	22	24	23	26	26	28	27	20	18.5
7	26	26	25	21	24	24	26	26	27	27	19.6	16.0
8	26	26	24	21	23	25	26	27	27	28	19.7	16.8
9	26	26	20	21	24	26	26	26	27	27	19.4	18.1
10	26	26	16.8	22	25	26	26	26	27	27	19.4	18.1
11	26	26	16.9	23	25	27	26	26	27	27	19.2	18.1
12	27	26	19.5	26	25	28	26	26	26	27	19.3	18.1
13	25	26	19.0	26	26	26	26	27	26	27	19.3	18.1
14	27	26	20	26	26	26	26	27	27	27	19.1	18.1
15	27	26	22	25	26	26	26	27	27	27	19.3	17.9
16	27	26	22	24	26	26	26	28	27	26	19.2	17.7
17	25	26	25	23	26	26	26	27	27	26	19.6	18.1
18	24	26	26	22	26	26	26	26	27	26	19.8	18.1
19	25	26	26	21	26	26	26	26	27	26	20	18.1
20	25	26	26	21	23	27	26	26	27	26	21	18.1
21	26	26	26	21	26	26	26	26	28	26	20	18.1
22	17.6	25	26	21	26	27	26	26	27	26	19.7	17.7
23	26	25	25	21	26	26	26	26	27	25	19.2	17.7
24	26	24	26	23	26	26	26	26	27	25	19.2	17.9
25	26	25	25	23	26	27	26	26	27	23	18.7	17.9
26	26	25	26	24	26	27	27	26	27	24	18.7	16.8
27	26	25	26	24	26	26	26	26	27	23	18.6	16.4
28	26	25	26	23	24	27	27	26	27	23	18.3	16.8
29	26	24	26	22	22	27	27	26	27	23	18.4	16.8
30	26	24	25	22	.....	27	27	25	27	22	19.0	16.8
31	26	.....	25	22	.....	26	.....	25	.....	26	19.3	.....

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charge, in second-feet, of Spring Valley Water Co.'s aqueduct near Sunolglen, Cal., for the years ending Sept. 30, 1903–1914—Continued.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	16.8	13.9	15.6	18.1	7.5	7.8	11.6	27	27	26	21	26
.....	16.4	14.4	15.6	18.1	7.5	7.8	11.2	27	27	27	22	27
.....	16.2	14.4	15.6	18.1	7.6	8.9	11.1	27	26	27	22	26
.....	16.0	14.4	15.6	18.3	7.5	8.0	11.1	27	26	26	22	26
.....	16.0	14.5	15.6	18.5	7.5	7.8	23	27	26	26	23	26
.....	15.6	16.6	15.6	18.7	7.6	7.8	26	27	26	25	23	26
.....	15.6	14.8	15.6	18.9	7.5	7.7	26	27	26	25	24	26
.....	15.6	15.6	15.6	19.0	7.3	7.8	26	27	26	25	25	26
.....	15.6	15.6	15.4	16.2	8.1	7.8	26	27	27	25	25	25
.....	15.2	15.6	15.6	16.9	8.1	25	27	26	26	25	26	25
.....	15.2	15.6	15.6	18.5	7.5	26	27	26	26	25	26	25
.....	15.2	15.6	15.6	16.5	7.7	26	27	26	24	25	26	24
.....	14.8	26	15.2	15.6	7.8	25	27	26	23	25	26	24
.....	15.2	15.5	18.9	14.5	7.8	26	27	26	23	25	26	23
.....	15.2	15.3	16.4	21	7.8	26	26	26	22	25	26	23
.....	15.2	14.1	15.2	22	7.5	26	27	26	22	25	26	23
.....	15.6	11.7	15.2	20	8.0	27	27	26	21	25	26	23
.....	15.6	9.3	15.2	24	9.0	26	29	27	24	24	25	24
.....	15.6	13.6	15.2	24	8.7	26	27	27	25	27	25	24
.....	15.2	14.4	15.4	22	8.7	27	27	26	27	27	25	24
.....	14.8	14.4	12.6	21	8.7	26	27	26	27	24	25	24
.....	14.8	15.0	5.3	10.7	8.7	25	26	26	27	23	26	24
.....	14.8	15.4	5.3	16.4	8.6	25	26	27	27	22	27	24
.....	14.6	15.6	19.2	19.6	8.4	26	26	26	27	23	27	24
.....	14.8	15.6	20	18.5	8.4	25	27	27	27	23	27	24
.....	14.8	15.4	19.3	11.4	8.2	27	27	27	27	23	27	25
.....	14.4	15.6	19.0	7.5	8.1	26	27	27	26	22	27	26
.....	14.4	15.4	18.5	7.8	7.8	26	27	27	26	21	27	26
.....	14.4	15.6	18.1	7.8	.....	26	27	27	26	21	26	26
.....	14.4	15.6	18.1	7.5	.....	15.3	27	27	26	21	27	25
.....	14.4	.....	18.1	7.5	.....	9.9	.....	27	.....	21	27	.....
.....	25	25	23	28	30	27	29	25	25	23	20	.....
.....	24	24	23	24	24	27	29	26	26	24	19.7	.....
.....	25	24	23	29	28	27	31	26	26	24	19.7	.....
.....	26	24	23	28	29	27	28	26	25	23	25	.....
.....	26	24	19.9	29	28	27	29	26	25	23	26	.....
.....	26	22	13.2	29	28	27	31	27	25	23	27	.....
.....	25	23	12.6	29	28	27	31	27	25	23	27	.....
.....	25	23	15.1	29	28	27	29	27	25	23	26	.....
.....	25	23	16.9	33	29	27	30	27	25	23	26	.....
.....	24	23	21	30	29	27	29	27	25	23	26	.....
.....	24	24	24	30	29	27	29	27	25	23	26	.....
.....	24	22	27	29	29	27	29	27	25	23	26	.....
.....	23	23	26	29	29	27	29	27	25	23	26	.....
.....	23	23	24	28	29	27	30	26	25	23	26	.....
.....	23	24	26	27	28	27	30	26	25	22	27	.....
.....	25	24	26	30	25	27	30	26	25	22	27	.....
.....	26	23	26	31	27	27	28	26	25	22	27	.....
.....	26	22	24	30	27	27	27	26	25	22	26	.....
.....	26	23	26	31	26	27	27	26	25	22	.....	.....
.....	27	22	27	31	29	27	26	26	25	22	.....	.....
.....	25	23	26	31	29	25	25	25	25	23	.....	.....
.....	28	23	26	30	28	27	26	24	24	22	.....	.....
.....	26	23	27	31	27	29	26	24	24	21	.....	.....
.....	22	24	26	28	29	30	24	23	24	22	.....	.....
.....	26	22	26	31	27	30	24	24	24	22	.....	.....
.....	24	23	28	32	27	29	27	25	24	21	.....	.....
.....	25	23	27	32	27	30	26	26	24	21	.....	.....
.....	25	23	24	32	27	30	26	26	24	21	.....	.....
.....	24	23	26	31	.....	30	26	26	24	21	.....	.....
.....	27	23	26	28	.....	30	26	26	24	20	.....	.....
.....	24	.....	27	30	.....	29	.....	26	.....	20	.....	.....

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Daily discharge, in second-feet, of Spring Valley Water Co.'s aqueduct near Sunol, Cal., for the years ending Sept. 30, 1903–1914—Continued.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sep
1910–11.										
1	.....	20	27	28	26	26	26	26	27	
2	.....	20	27	27	27	26	27	27	26	
3	.....	18.0	27	27	27	26	26	26	27	
4	.....	21	25	26	27	27	27	26	26	
5	.....	20	23	27	27	28	26	27	27	
6	.....	20	25	27	26	30	27	24	27	
7	.....	21	27	21	26	28	27	23	27	
8	.....	21	27	4.6	26	26	27	25	27	
9	.....	21	27	4.6	27	26	27	27	27	
10	21	21	26	4.6	26	27	26	28	26	
11	22	21	27	4.6	26	29	26	27	26	
12	22	23	26	4.6	26	27	28	28	26	
13	21	20	5.9	4.6	27	27	27	27	26	
14	21	25	4.6	4.6	26	27	27	31	26	
15	.....	27	4.6	29	26	27	27	28	28	
16	19.8	27	4.6	27	26	27	26	27	28	
17	21	27	4.6	26	26	27	27	27	28	
18	22	26	4.6	28	24	26	27	26	27	
19	21	27	4.6	27	12.7	26	26	20	27	
20	21	27	4.6	26	27	26	27	18.7	26	
21	21	26	4.6	26	13.0	26	27	17.2	26	
22	20	26	26	26	27	27	27	14.2	25	
23	21	27	27	26	18.7	29	27	6.7	26	
24	21	27	27	26	19.6	28	27	26	26	
25	21	27	27	27	26	27	26	27	26	
26	21	27	27	27	26	27	26	27	28	
27	21	27	27	27	27	26	27	27	26	
28	20	27	26	27	26	26	26	27	26	
29	22	27	.....	27	28	26	26	26	25	
30	20	29	.....	26	26	28	28	26	25	
31	20	29	.....	26	.....	27	.....	27	24	....

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Se
1911–12.											
1	26	26	27	27	27	26	26	26	26	20	
2	26	27	27	25	29	26	26	26	26	19.6	
3	25	27	26	26	26	26	26	26	19.6	19.5	
4	26	26	26	26	27	26	26	25	19.6	19.8	
5	25	26	25	26	27	26	26	28	26	19.9	
6	25	26	26	26	26	26	26	27	25	19.3	
7	25	25	26	26	31	25	26	27	24	18.8	
8	25	26	25	26	25	26	26	27	24	17.9	
9	25	27	25	26	25	27	26	28	24	16.7	
10	25	26	27	26	26	26	26	27	24	17.6	
11	25	26	25	26	26	26	26	27	23	18.1	
12	25	26	26	26	26	26	26	28	23	18.6	
13	25	26	26	26	27	26	26	27	22	18.7	
14	25	26	26	26	25	26	26	27	21	18.2	
15	25	26	26	26	26	26	26	27	22	18.5	
16	26	27	26	25	26	26	26	27	21	18.2	
17	25	27	25	24	26	26	26	27	16.6	19.0	
18	25	27	25	26	28	26	27	27	21	18.2	
19	26	27	26	26	25	26	26	28	12.6	17.8	
20	26	26	26	24	28	26	26	27	22	18.0	
21	26	25	23	25	23	26	26	27	21	18.1	
22	26	27	21	26	23	26	26	27	21	18.1	
23	25	25	26	26	26	26	26	27	19.9	17.6	
24	25	29	26	24	27	26	26	27	20	17.2	
25	25	26	26	24	25	26	26	27	20	17.0	
26	26	26	26	25	27	26	26	27	21	16.7	
27	25	26	26	27	26	26	26	27	19.9	16.9	
28	26	26	25	26	26	26	27	27	19.4	17.2	
29	27	26	28	29	26	26	26	25	20	17.2	
30	26	27	28	.....	26	26	26	26	18.8	17.7	
31	.....	26	24	.....	26	.....	26	.....	20	17.6	....

[a] Sept. 30, 1911, was only day marked estimated from Belmont pump record in the month, but mon[t]*al indicates that 2 other days should have been so marked; then discharge for Sept. 30 would be 24 [s]econd-feet, and the 2 other discharges would be about 5 second-feet greater.*

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ischarge, in second-feet, of Spring Valley Water Co.'s aqueduct near Sunolglen, Cal., for the years ending Sept. 30, 1903–1914—Continued.

r.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
13.												
.....	15.6	15.2	17.4	16.0	26	26	35	31	25	17.6	17.1	21
.....	15.6	15.2	17.4	16.0	26	26	34	31	25	21	16.8	19.6
.....	15.6	15.2	16.4	17.2	25	26	34	28	24	19.8	12.8	19.5
.....	15.6	15.2	16.2	16.1	26	26	34	30	24	19.6	17.0	18.6
.....	16.0	15.2	16.8	15.8	27	27	34	30	24	20	16.5	17.9
.....	15.6	15.2	15.6	16.5	25	27	34	30	24	19.4	14.6	13.2
.....	15.6	15.2	15.2	15.8	24	26	33	29	24	17.5	17.6	18.1
.....	15.6	15.2	16.0	15.6	26	26	33	29	24	19.1	16.3	18.8
.....	15.6	15.2	17.6	17.3	26	26	27	28	24	19.2	15.8	15.1
.....	15.6	15.2	15.8	22	27	27	26	29	24	19.0	11.4	18.3
.....	15.6	15.2	16.0	23	26	26	26	27	23	18.7	16.7	18.1
.....	18.2	15.2	16.8	21	25	26	35	28	24	18.6	11.4	17.0
.....	14.6	15.2	14.9	21	27	26	35	28	23	18.4	13.9	14.3
.....	14.8	15.2	16.4	20	26	26	34	28	23	19.3	12.8	17.3
.....	15.2	15.2	15.9	18.8	26	26	36	28	23	18.3	15.6	18.1
.....	15.2	12.6	14.8	10.4	26	26	35	27	23	15.5	5.7	17.0
.....	15.2	2.1	14.8	21	27	26	35	28	22	18.1	4.1	17.2
.....	15.2	2.2	15.2	31	27	26	34	27	22	18.4	4.1	17.4
.....	15.2	2.2	15.6	28	27	26	35	28	22	17.8	3.9	14.9
.....	15.2	2.6	15.6	26	27	26	35	27	22	18.0	5.1	12.3
.....	15.2	3.3	15.6	25	26	26	35	27	22	18.6	8.3	14.2
.....	14.8	8.3	16.8	26	26	26	33	27	22	17.9	15.1	17.8
.....	14.9	13.9	16.8	25	26	27	33	26	19.8	17.3	16.7	17.5
.....	14.8	14.6	16.4	25	26	25	33	26	22	18.4	12.9	14.4
.....	15.2	16.7	16.4	23	26	26	32	25	19.2	18.0	15.9	17.9
.....	15.4	16.8	16.4	26	26	27	31	27	21	17.9	12.1	17.6
.....	15.2	16.8	16.4	14.3	26	25	31	25	21	17.8	15.3	17.0
.....	15.2	16.8	16.4	22	26	27	30	25	21	18.0	16.8	13.9
.....	15.2	16.4	16.4	25	.....	30	31	26	20	17.5	20	15.1
.....	15.2	16.8	15.6	28	.....	37	31	25	21	16.9	11.7	16.0
.....	15.2	.....	16.4	26	.....	37	.....	25	.....	12.6	13.7	.....
14.												
.....	16.2	13.4	17.0	35	35	36	37	34	35	36	31	27
.....	16.5	12.1	16.5	33	34	35	36	35	35	36	32	82
.....	15.8	13.8	17.3	32	34	35	36	35	34	35	33	25
.....	15.8	14.2	17.0	34	34	35	36	35	34	34	33	27
.....	14.5	13.9	17.0	33	35	35	38	35	34	35	30	25
.....	16.9	15.1	17.0	30	35	35	39	35	35	34	32	21
.....	16.3	12.0	16.7	29	35	34	37	35	35	33	32	27
.....	13.7	14.2	17.0	26	35	34	37	36	36	34	32	27
.....	14.4	14.0	16.4	33	35	34	37	26	35	32	33	27
.....	16.6	15.1	16.9	30	36	35	37	16.7	35	33	31	25
.....	16.5	20	16.8	29	37	36	38	16.9	36	33	30	25
.....	16.1	18.0	16.9	30	36	35	33	7.2	35	33	31	27
.....	10.9	18.3	16.7	37	36	28	35	36	34	33	32	23
.....	15.7	18.1	16.7	35	37	26	37	35	36	32	32	22
.....	16.2	18.6	14.8	34	36	27	36	35	35	32	32	26
.....	14.6	21	17.0	32	36	33	36	37	35	32	32	26
.....	15.9	16.3	15.9	34	36	36	36	37	35	32	32	26
.....	15.8	15.7	10.2	36	36	35	32	36	36	31	31	24
.....	15.9	15.6	14.8	34	35	38	12.9	35	36	29	31	25
.....	16.2	16.1	17.8	33	35	46	36	35	36	31	29	25
.....	16.3	17.8	18.0	34	35	47	37	36	36	30	29	26
.....	16.2	18.0	24	33	35	37	37	35	36	30	30	26
.....	14.6	18.0	14.2	34	35	37	37	32	36	31	30	26
.....	12.8	18.1	26	31	37	37	37	35	36	29	29	26
.....	15.6	18.0	27	35	36	37	37	32	36	31	29	26
.....	15.4	18.0	28	35	35	37	37	29	37	33	30	26
.....	15.8	17.9	26	35	36	37	37	33	36	32	29	26
.....	15.6	13.9	28	35	35	36	37	35	36	32	27	26
.....	15.9	17.1	28	33	.....	36	36	35	36	30	28	92
.....	15.4	17.3	22	33	.....	35	35	35	36	31	28	26
.....	10.5	.....	29	35	.....	37	.....	34	.....	33	29	.....

-Discharge Apr. 1–14, 1906, estimated from Belmont pump records as follows: Belmont pump times oximate). May 1–19, 1906, no records; quantities estimated. Mar. 25–30, 1907, records missing; pumps shut down; quantities taken as draft between Brightside and Belmont. Aug. 29 to Dec. stimated in monthly table. "Pumps shut down Oct. 6–8, 15, and 23–25, 1910; Feb. 13 and 21 8–14, 1911." October, 1911, estimated in the monthly table.

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Monthly discharge of Spring Valley Water Co.'s aqueduct near Sunolglen, Cal., for the years ending Sept. 30, 1903–1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1903.				
April 6–30	27	23	25.5	1,200
May	26	22	24.7	1,520
June	28	25	26.0	1,550
July	27	25	26.7	1,640
August	24	19.8	22.2	1,360
September	19.8	17.1	18.4	1,090
The period				8,420
1903–4.				
October	17.5	15.8	16.6	1,020
November	27	14.4	19.8	1,180
December	26	25	25.2	1,550
January	26	24	25.2	1,550
February	26	19.8	24.1	1,300
March	27	23	25.2	1,550
April	26	24	25.0	1,490
May	27	24	25.6	1,570
June	27	25	25.9	1,540
July	27	25	26.1	1,600
August	27	19.8	23.4	1,440
September	19.4	17.5	18.3	1,090
The year	27	14.4	23.4	17,060
1904–5.				
October	19.4	17.5	18.2	1,120
November	19.8	19.1	19.4	1,150
December	23	19.8	20.3	1,250
January	26	16.7	24.1	1,480
February	26	19.8	24.0	1,330
March	26	22	24.4	1,500
April	27	23	25.1	1,490
May	27	24	25.5	1,570
June	27	25	26.2	1,560
July	27	17.1	25.6	1,570
August	27	18.7	22.6	1,390
September	18.1	14.9	16.5	982
The year	27	14.9	22.7	16,490
1905–6.				
October	14.9	13.8	14.1	867
November	14.6	13.6	13.8	821
December	14.8	13.8	14.2	873
January	23	11.5	18.0	1,110
February	27	22	25.1	1,390
March	27	19.8	25.0	1,540
April	27	1.9	17.9	1,070
May	20	5.4	10.5	646
June	24	19.9	20.8	1,240
July	24	22	23.0	1,410
August	27	23	24.8	1,530
September	27	24	25.0	1,490
The year	27	1.9	19.3	14,000
1906–7.				
October	26	22	23.1	1,420
November	24	21	22.1	1,320
December	27	14.5	21.8	1,340
January	26	18.4	23.4	1,440
February	27	23	25.7	1,480
March	27	.9	18.8	1,160
April	28	26	26.3	1,560
May	28	26	27.1	1,670
June	28	26	27.0	1,610
July	29	22	26.7	1,640
August	29	26	27.2	1,670
September	27	25	26.5	1,580
The year	29	.9	24.6	17,900

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Monthly discharge of Spring Valley Water Co.'s aqueduct near Sunolglen, Cal., for the years ending Sept. 30, 1908–1914—Continued.

Month.	Discharge in second-feet.			Run-off (total acre-feet).
	Maximum.	Minimum.	Mean.	
1907–8.				
October	27	17.6	25.6	1,570
November	27	24	25.6	1,520
December	26	16.8	23.8	1,460
January	26	21	22.8	1,400
February	26	22	25.1	1,440
March	28	23	26.0	1,600
April	27	26	26.1	1,550
May	28	25	26.2	1,610
June	28	24	26.9	1,600
July	28	22	25.9	1,590
August	22	18.3	19.5	1,200
September	19.8	16.0	17.8	1,060
The year	28	16.0	24.3	17,600
1908–9.				
October	16.8	14.4	15.2	935
November	26	9.3	15.2	904
December	20	5.3	15.7	965
January	24	7.5	16.6	1,020
February	9.0	7.3	7.99	444
March	27	7.7	19.8	1,220
April	29	11.1	24.6	1,460
May	27	26	26.6	1,640
June	27	21	25.5	1,520
July	27	21	24.3	1,490
August	27	21	25.3	1,560
September	27	23	24.8	1,480
The year	29	5.3	20.2	14,600
1909–10.				
October	28	22	25.0	1,540
November	25	22	23.2	1,380
December	28	12.6	23.7	1,460
January	33	24	29.7	1,830
February	30	24	27.9	1,550
March	30	25	27.7	1,700
April	31	24	27.9	1,660
May	27	23	25.9	1,590
June	26	24	24.8	1,480
July	24	20	22.3	1,370
August	27	.....	[a] 24.7	1,520
September	.....	.....	[a] 20.7	1,230
The year	33	.....	25.3	18,300
1910–11.				
October	.....	.....	[a] 11.1	682
November	.....	.....	[a] 16.0	952
December	.....	.....	[a] 21.3	1,310
January	29	18.0	24.3	1,490
February	27	4.6	19.4	1,080
March	29	4.6	21.6	1,330
April	28	12.7	25.0	1,490
May	30	26	27.0	1,660
June	28	26	26.7	1,590
July	31	6.7	24.8	1,520
August	28	24	26.4	1,620
September	[b] 33	21	23.6	1,400
The year	[b] 33	.....	22.3	16,100
1911–12.				
October	.....	.....	[a] 25.8	1,590
November	27	25	25.4	1,510
December	29	25	26.3	1,620
January	28	21	25.7	1,580
February	29	24	25.8	1,480
March	31	23	26.2	1,610
April	27	25	26.0	1,550
May	27	26	26.1	1,600
June	28	25	26.9	1,600
July	26	12.6	21.4	1,320
August	20	16.7	18.2	1,120
September	17.6	13.5	16.2	964
The year	.....	12.6	24.2	17,500

[a] Estimated by the company from Belmont pump records. [b] See footnote to daily discharge table.

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Monthly discharge of Spring Valley Water Co.'s aqueduct near Sunolglen, Cal., f years ending Sept. 30, 1903–1914—Continued.

Month.	Discharge in second-feet.			Ru (t acr
	Maximum.	Minimum.	Mean.	
1912–13.				
October	18.2	14.6	15.4	
November	16.8	2.1	13.0	
December	17.6	14.8	16.1	
January	31	10.4	21.1	
February	27	24	26.1	
March	37	25	27.0	
April	36	26	32.8	
May	31	25	27.6	
June	25	19.2	22.6	
July	21	12.6	18.2	
August	20	3.9	13.2	
September	21	12.3	16.8	
The year	37	2.1	20.8	
1913–14.				
October	16.9	10.5	15.3	
November	21	12.0	16.3	
December	29	10.2	19.2	
January	37	26	33.0	
February	37	34	35.4	
March	47	26	35.5	
April	39	12.9	35.6	
May	37	7.2	32.4	
June	37	34	35.4	
July	36	29	32.3	
August	33	27	30.6	
September	28	21	25.6	
The year	47	7.2	28.9	

NOTE.—Monthly and yearly discharge for all years computed by engineers of U. S. Geological S

KERN RIVER BASIN.

KERN RIVER NEAR KERNVILLE, CAL.

LOCATION.—In sec. 14, T. 23 S., R. 32 E., at base of Fairview Mountain, in National Forest, 3 miles above Salmon Creek and about 15 miles north of ville.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—January 1, 1912, to September 30, 1914.

GAGE.—Vertical staff in three sections fastened to overhanging willow tree o bank about 1 mile above mouth of Tobias Creek; on March 17, 1914, new v staff in two sections was installed at same datum, 7 feet downstream from o gage. Friez water-stage recorder was installed September 15, 1913, abo feet downstream.

DISCHARGE MEASUREMENTS.—Made from cable about 250 feet below staff g by wading.

CHANNEL AND CONTROL.—Coarse gravel and boulders; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year from automatic gage 4.6 feet at 8 a. m. June 4 (discharge, 3,680 second-feet); minimum stag recorder, −0.70 foot November 2 (discharge, 150 second-feet).

1912–1914: Maximum stage recorded, 4.6 feet (from automatic gage rec 8 a. m. June 4, 1914 (discharge, 3,680 second-feet); minimum stage re −0.75 foot January 6, 1913 (discharge, 142 second-feet).

ACCURACY.—Rating curve is well defined; results are excellent.

COOPERATION.—Station maintained in cooperation with United States Forest S *and Southern* California Edison Co., through H. W. Dennis, engineer.

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Discharge measurements of Kern River near Kernville, Cal., during the year ending Sept. 30, 1914.

[Made by H. J. Tompkins.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Mar. 16	1.68	1,020	Mar. 23	3.80	2,800
19	2.07	1,210			

Daily discharge, in second-feet, of Kern River near Kernville, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	190	180	220	488	675	585	860	1,210	3,560	3,220	1,180	452
2	190	150	200	435	608	608	890	1,180	3,560	3,220	1,320	435
3	210	210	200	488	545	608	1,010	1,240	3,560	3,110	1,210	435
4	210	200	200	370	525	630	1,140	1,440	3,560	2,800	1,140	418
5	200	200	200	340	505	675	1,280	1,600	3,330	2,500	1,140	400
6	200	190	220	315	470	750	1,280	1,730	2,900	2,400	1,180	385
7	200	190	220	302	452	830	1,240	1,940	2,650	2,360	1,180	385
8	200	180	208	302	435	890	1,240	2,120	2,450	2,220	1,400	370
9	200	180	200	265	418	920	1,240	2,170	2,360	2,120	1,110	370
10	190	180	200	230	418	950	1,600	2,170	2,400	1,940	1,080	370
11	190	180	190	265	435	980	1,360	2,170	2,550	1,860	980	370
12	190	190	180	265	435	1,010	1,320	2,310	2,700	1,730	920	355
13	180	210	190	265	435	980	1,400	2,550	2,650	1,730	860	340
14	180	230	210	278	435	950	1,640	2,600	2,700	1,730	890	340
15	180	220	200	328	452	980	1,860	2,500	2,500	1,680	860	328
16	180	220	190	335	452	1,040	1,770	2,450	2,650	1,680	802	328
17	180	220	200	340	452	1,140	1,680	2,550	2,900	1,860	802	328
18	180	240	190	435	505	1,210	1,730	2,800	3,110	1,940	775	315
19	180	278	190	315	488	1,240	1,940	2,900	2,850	1,990	700	315
20	180	252	200	315	565	1,320	2,120	3,000	2,700	1,770	652	315
21	180	230	200	355	890	1,400	2,120	2,950	2,650	1,680	608	315
22	180	210	240	608	652	1,440	1,900	2,800	2,800	1,520	585	302
23	180	210	220	545	608	1,440	1,640	2,750	2,850	1,400	545	302
24	172	220	230	1,520	565	1,400	1,480	2,650	2,800	1,400	545	302
25	172	234	240	3,560	545	1,320	1,440	2,500	2,650	1,440	525	315
26	172	230	230	3,330	525	1,360	1,360	2,310	2,400	1,440	525	505
27	172	220	230	1,280	525	1,180	1,280	2,360	2,450	1,280	505	608
28	172	230	230	802	545	1,110	1,280	2,700	2,650	1,320	505	488
29	172	220	230	675	.....	1,040	1,210	3,110	2,900	1,210	488	470
30	172	230	290	700	.....	980	1,180	3,440	3,110	1,140	470	435
31	172	.....	400	700	.....	920	.....	3,440	.....	1,110	470	.....

Monthly discharge of Kern River near Kernville, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	210	172	185	11,400	B.
November	278	150	211	12,600	B.
December	400	180	218	13,400	A.
January	3,560	230	671	41,300	A.
February	890	418	520	28,900	A.
March	1,440	585	1,030	63,300	A.
April	2,120	860	1,450	86,300	A.
May	3,440	1,180	2,380	146,000	A.
June	3,560	2,360	2,830	168,000	A.
July	3,220	1,110	1,900	117,000	A.
August	1,400	470	837	51,500	A.
September	608	302	380	22,600	A.
The year	3,560	150	1,050	762,000	

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KERN RIVER NEAR BAKERSFIELD, CAL.[1]

LOCATION.—In sec. 2, T. 29 S., R. 28 E., at mouth of lower canyon, 5 miles northeast of Bakersfield.

DRAINAGE AREA.—2,345 square miles.

RECORDS AVAILABLE.—January 1, 1894, to June 30, 1907; March 1, 1908, to September 30, 1914.

GAGE.—Water-stage recorder at footbridge.

DISCHARGE MEASUREMENTS.—Made from footbridge at gage.

CHANNEL AND CONTROL.—Sand and shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, January 26 (discharge, 18,300 second-feet); minimum stage recorded, October 31 (discharge, 197 second-feet).

1896–1914: Maximum stage recorded January 26, 1914 (discharge, 18,300 second-feet); minimum stage recorded September 15, 1898 (discharge, 80 second-feet).

DIVERSIONS.—Several small diversions on main river and South Fork for irrigation. Water diverted at and below Kernville for power development is returned to the river above the station.

ACCURACY.—Results considered good.

COOPERATION.—Daily discharge record furnished by Kern County Land Co., through A. K. Warren, engineer.

Daily discharge, in second-feet, of Kern River near Bakersfield, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	228	204	278	472	1,468	1,114	1,478	2,047	4,604	3,515	1,161	501
2	220	206	274	543	1,317	1,132	1,385	2,098	4,714	3,557	1,219	486
3	212	204	264	609	1,194	1,159	1,401	2,073	4,743	3,452	1,347	472
4	217	284	253	620	1,117	1,155	1,598	2,272	4,624	3,243	1,251	462
5	221	285	246	574	1,070	1,154	1,813	2,572	4,449	2,970	1,186	446
6	218	249	245	506	1,041	1,187	2,148	2,730	4,116	2,639	1,143	431
7	224	243	248	462	986	1,333	2,178	2,853	3,504	2,612	1,163	422
8	223	242	252	441	938	1,438	2,179	3,135	3,235	2,473	1,172	409
9	227	229	247	423	908	1,539	2,208	3,385	2,947	2,310	1,306	396
10	230	227	246	413	886	1,500	2,420	3,483	2,766	2,200	1,172	383
11	232	237	245	375	866	1,559	2,671	3,481	2,785	2,052	1,147	382
12	226	235	239	363	877	1,624	2,484	3,151	2,885	1,985	1,029	380
13	229	248	242	387	889	1,638	2,475	3,562	2,991	1,909	970	380
14	228	263	257	403	873	1,620	2,597	3,783	2,984	1,941	924	380
15	223	273	266	441	868	1,657	2,901	3,749	3,074	1,872	927	380
16	217	282	265	511	870	1,686	3,113	3,649	2,901	1,873	907	376
17	216	269	278	611	845	1,779	3,095	3,768	3,139	1,818	863	375
18	214	262	265	610	828	1,885	2,998	3,883	3,364	1,928	849	366
19	208	273	255	751	938	1,967	2,999	4,041	3,430	1,973	816	353
20	203	277	248	619	963	1,976	3,269	4,178	3,311	2,019	777	336
21	212	301	247	530	1,736	2,028	3,421	4,247	3,106	1,812	738	338
22	210	285	251	501	2,186	2,130	3,469	4,115	3,160	1,722	655	333
23	211	274	280	1,575	1,650	2,224	2,928	3,916	3,236	1,559	640	370
24	215	255	302	2,879	1,151	2,242	2,606	3,805	3,180	1,485	605	350
25	218	266	286	9,574	1,288	2,175	2,394	3,690	3,081	1,478	583	332
26	218	217	304	15,478	1,217	2,072	2,294	3,467	2,915	1,057	557	309
27	216	270	304	7,939	1,149	1,985	2,182	3,252	2,726	1,482	561	443
28	218	270	282	3,960	1,129	1,934	2,141	3,327	2,910	1,383	555	668
29	215	276	284	2,507	.....	1,726	2,146	3,678	3,141	1,403	546	602
30	206	295	340	1,977	.....	1,687	2,051	4,105	3,349	1,292	515	548
31	202	.....	375	1,703	.....	1,593	.....	4,421	.....	1,192	509	.....

[1] Station also known as at "first point of measurement."

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Monthly discharge of Kern River near Bakersfield, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	237	197	218	13,400
November	327	201	258	15,300
December	413	235	270	16,600
January	18,287	355	1,895	117,000
February	2,620	803	1,127	62,800
March	2,297	1,039	1,671	103,000
April	3,785	1,359	2,436	145,000
May	4,686	1,987	3,426	211,000
June	4,873	2,618	3,379	201,000
July	3,822	1,144	2,087	129,000
August	1,434	501	897	55,200
September	726	340	424	25,200
The year	18,287	197	1,510	1,090,000

NOTE.—Maximum, minimum, and mean discharge furnished by the Kern County Land Co.; maximum and minimum were determined from absolute maximum and minimum gage heights as recorded by the company's water-stage recorder. Run-off in acre-feet computed by engineers of United States Geological Survey.

KERN RIVER POWER CO.'S CANAL AT KERNVILLE, CAL.

LOCATION.—At the Beattie ranch, 1,000 feet below intake and about three-fourths of a mile below Kernville.

RECORDS AVAILABLE.—January 1, 1910, to September 30, 1914.

GAGE.—Water-stage recorder on left bank at short flume and a vertical staff just below flume in concrete-lined section of canal.

DISCHARGE MEASUREMENTS.—Made in flume at recorder.

EXTREMES OF STAGE.—1910–1914: Maximum stage recorded August 1 to 3, 1914 (discharge, 624 second-feet); canal dry March 15 to 29, April 22 to June 9, June 11 to 18, June 20 to 30, and July 14 to 18, and periods every year.

ACCURACY.—Results are considered excellent.

COOPERATION.—Daily discharge records furnished by Kern River Power Co., through H. A. Barre, chief engineer.

The canal diverts from Kern River about half a mile below Kernville. It is about 10 miles long and is concrete lined except where flume is required. The power house is in the canyon at Borel, where the water is returned to the river. The power is transmitted to Los Angeles.

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Daily discharge, in second-feet, of Kern River Power Co.'s canal at Kernville, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	June.	July.	Aug.	Sept.
1	216	187	233	443	467	439	575	0	2	624	448
2	207	199	215	536	467	444	579	0	333	624	432
3	205	317	214	473	531	448	580	0	428	624	418
4	224	255	209	495	575	390	.....	0	478	604	412
5	227	0	204	405	597	524	155	0	507	592	404
6	217	218	219	376	580	575	0	0	527	600	394
7	215	217	232	.....	546	546	440	0	571	606	386
8	213	213	223	331	544	431	300	0	596	604	386
9	216	218	217	341	524	0	580	0	596	616	386
10	0	205	213	289	509	184	580	150	594	616	360
11	211	240	211	271	507	184	580	0	613	586	350
12	209	208	209	301	522	184	580	0	598	624	338
13	203	363	206	293	519	184	580	0	506	624	324
14	199	241	229	289	331	184	580	0	0	620	330
15	197	255	241	308	517	0	581	0	0	624	327
16	0	241	225	.....	536	0	579	0	0	624	320
17	193	230	221	419	534	0	576	0	0	624	320
18	194	233	229	363	532	0	579	0	0	586	314
19	190	280	209	497	594	0	579	127	579	624	312
20	189	281	213	356	585	0	579	0	616	624	324
21	187	271	221	331	598	0	578	0	610	424	324
22	187	255	219	384	597	0	0	0	610	612	308
23	186	0	312	526	597	0	0	0	618	580	300
24	186	211	245	575	429	0	0	0	618	558	296
25	185	299	257	.....	430	0	0	0	518	422	300
26	182	243	273	457	429	0	0	0	612	516	324
27	180	238	261	500	429	0	0	0	550	512	620
28	182	236	245	468	429	143	0	0	516	510	586
29	180	240	259	428	.....	347	0	0	506	496	496
30	180	233	267	467	.....	341	0	0	592	482	472
31	182	.....	333	467	.....	575	.....	.....	604	462	.....

NOTE.—No record for Jan. 7, 16, and 25 and Apr. 4. No flow during May.

Monthly discharge at Kern River Power Co.'s canal at Kernville, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	227	0	185	11,400
November	333	0	227	13,500
December	333	204	234	14,400
January	.....	.....	.....	.....
February	598	331	516	28,700
March	575	0	204	12,500
April	.....	0	.....	.....
May	0	0	0	0
June	150	0	9.2	547
July	618	0	448	27,500
August	624	422	575	35,400
September	620	296	377	22,400

NOTE.—Monthly discharge computed by engineers of U. S. Geological Survey.

SOUTH FORK OF KERN RIVER NEAR ONYX, CAL.

LOCATION.—In the NE. ¼ SW. ¼ sec. 24, T. 25 S., R. 35 E., three-fourths mile north of the Kernville-Walker Pass road, on Rankin ranch, and about 5 miles northeast of Onyx.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 12, 1911, to August 31, 1914, when the station was *discontinued.*

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GAGE.—Vertical staff fastened to willow stump. An inclined staff installed at same site and datum November 16, 1912, was destroyed by high water January 26, 1914; readings on temporary gage used February 14 to March 13, 1914, reduced to correct datum; new inclined staff installed at same location and datum as previous gage March 14, 1914. Observer, L. E. Rankin.

DISCHARGE MEASUREMENTS.—Made from cable 60 feet below gage or by wading.

CHANNEL AND CONTROL.—Sand and fine gravel; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 7.1 feet January 25 (discharge, 2,360 second-feet); minimum stage recorded, 1.0 foot August 22 (discharge, 21 second-feet).

1911–1914: Maximum stage recorded, 7.1 feet January 25, 1914 (discharge, 2,360 second-feet); minimum discharge, 14 second-feet October 1 and 2, 1912, and August 19, 1913.

DIVERSIONS.—Three small irrigation ditches head above the station.

ACCURACY.—Rating curve fairly well defined; results good.

Discharge measurements of South Fork of Kern River near Onyx, Cal., during the year ending Sept. 30, 1914.

[Made by H. J. Tompkins.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Oct. 11	1.65	27	Mar. 15	3.00	334
Mar. 14	2.90	324	21	4.05	777

Daily discharge, in second-feet, of South Fork of Kern River near Onyx, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	24	27	38	80	.....	236	410	610	800	68	90
2	24	30	38	80	.....	236	410	610	750	79	90
3	24	30	38	80	.....	236	525	700	750	90	79
4	24	34	38	80	.....	236	525	700	525	90	68
5	24	34	38	80	.....	287	750	700	525	90	65
6	24	34	38	68	.....	287	800	750	445	90	62
7	24	34	38	57	.....	287	800	750	445	90	59
8	24	34	38	57	.....	287	800	800	375	90	59
9	24	34	38	68	.....	287	850	800	375	90	212
10	24	34	47	68	.....	287	850	850	345	90	180
11	24	34	47	68	.....	236	850	850	212	90	149
12	24	34	57	68	.....	236	905	960	212	90	118
13	24	38	57	68	.....	315	960	960	170	84	118
14	24	38	57	57	103	315	960	960	170	79	118
15	24	38	47	57	103	345	960	1,010	261	79	88
16	24	38	47	57	103	345	1,180	1,010	261	91	59
17	24	38	42	57	103	345	1,240	905	212	103	59
18	24	57	42	57	190	345	1,240	850	170	103	46
19	24	57	42	57	190	410	1,240	750	134	90	34
20	24	57	42	57	315	410	1,240	750	134	90	21
21	27	57	47	50	315	410	1,300	750	118	79	21
22	27	57	47	225	236	345	1,300	750	118	79	21
23	27	38	57	805	236	345	1,240	850	118	79	42
24	27	38	57	1,980	236	375	1,240	850	90	74	42
25	27	38	57	2,360	212	410	1,240	850	90	74	42
26	27	38	48	.....	212	410	1,010	905	90	66	42
27	27	38	47	.....	212	525	1,010	1,010	79	59	42
28	27	38	57	.....	212	525	750	1,010	79	59	42
29	27	38	57	.....	.....	525	750	1,010	79	59	42
30	27	38	57	.....	.....	410	610	1,070	68	69	42
31	27	.....	80	.....	.....	410	.....	905	.....	79	42

NOTE.—Discharge determined as follows: Oct. 1, 1913, to Jan. 25, 1914, from a rating curve fairly well defined between 40 and 500 second-feet. Feb. 14 to Aug. 29, 1914, from a rating curve fairly well defined between 40 and 1,000 second-feet. No gage-height record, discharge interpolated, July 6, 8, 10, 13, 16, 26, 28, and 30; Aug. 3, 5, 6, 10, 11, 13, 15, 18, 19, 21, 24, 27, 28, 30, and 31. No record Jan. 26 to Feb. 13.

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Monthly discharge of South Fork of Kern River near Onyx, Cal., for the year endi 30, 1914.

Month.	Discharge in second-feet.			Run-of (total i acre-feet
	Maximum.	Minimum.	Mean.	
October	27	24	25.1	1,5
November	57	27	39.1	2,3
December	80	38	47.7	2,9
January 1–25	2,360	50	270	13,4
February 14–28	315	103	199	5,9
March	525	236	344	21,2
April	1,300	410	932	55,5
May	1,070	610	846	52,0
June	800	68	273	16,2
July	103	59	82.0	5,0
August	212	21	70.8	4,3

ERSKINE CREEK NEAR BODFISH,[1] CAL.

LOCATION.—In the SW. ¼ SW. ¼ sec. 24, T. 27 S., R. 33 E., 700 feet west Liebel's residence, about 6 miles southeast of Bodfish and 8 miles sout Isabella, in Sequoia National Forest. Prior to March 28, 1913, about downstream, in the NW. ¼ sec. 9, T. 27 S., R. 33 E., at ford at mouth of 2¾ miles above junction with Kern River, 5 miles south of Isabella and east of Bodfish.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—February 7, 1911, to September 30, 1914 (fragmentary

GAGE.—Vertical staff on left bank.

DISCHARGE MEASUREMENTS.—Made by wading near gage.

CHANNEL AND CONTROL.—Sand and gravel.

EXTREMES OF STAGE.—Maximum stage recorded during year, 3.85 feet Jan minimum stage recorded, 1.3 feet September 5 and 12.

1912–1914: Maximum stage recorded, 3.85 feet, January 25, 1914; m stage recorded, 1.2 feet, December 8 and 30, 1912, October 20, Novemb 15, December 8 and 30, 1913.

DIVERSIONS.—A small ditch diverts water for irrigation about 5 miles above

COOPERATION.—Station maintained in cooperation with United States Forest

No estimates of discharge made.

Discharge measurements of Erskine Creek near Bodfish, Cal., during the year endi 30, 1914.

[Made by H. J. Thompkins.]

Date.	Gage height.
	Feet.
March 21	2.02
May 25	1.70

[1] Records published formerly as "near Isabella."

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Daily gage height, in feet, of Erskine Creek near Bodfish, Cal., for the year ending Sept. 30, 1914.

[Otto Leibel, observer.]

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		1.80	2.15	2.18	1.90	1.92				1.40	
2		1.82	2.18	2.08	1.89		1.88				
3		1.82	2.20	1.98	1.90	1.85					
4		1.85	2.20	1.92	1.92				1.45		
5		1.85	2.20	1.90	1.92						1.30
6		1.88	2.20	1.89	1.95			1.65			
7		1.88	2.20	1.88	1.95						
8	1.60	1.90	2.20	1.85	1.95	1.98				1.35	
9	1.60	1.90	2.20	1.84	1.95		1.88				
10	1.60	1.92	2.22	1.82	1.98						
11	1.62	1.92	2.22	1.81	1.98				1.42		
12	1.62	1.95	2.22	1.80	1.98						1.30
13	1.65	1.95	2.22	1.80	1.98			1.60			
14	1.65	1.98	2.24	1.78	1.98						
15	1.68	1.98	2.28	1.78	2.00					1.32	
16	1.68	2.00	2.31	1.78	2.02		1.82				
17	1.68	2.00	2.28	1.84	2.02						
18	1.70	2.02	2.31	1.80	2.02				1.40		
19	1.70	2.02	2.30	1.94	2.02						1.32
20	1.70	2.02	2.30	2.31	2.02						
21	1.72	2.04	2.30	2.15	2.02			1.60			
22	1.72	2.05	2.48	2.11	2.02					1.30	
23	1.72	2.05	2.45	2.04	2.02		1.75				
24	1.75	2.08	3.35	1.98	2.00						
25	1.75	2.08	3.85	1.96	2.00	1.85			1.40		
26	1.75	2.08	3.45	1.94	1.98						
27	1.78	2.08	2.55	1.92	1.98			1.50			1.35
28	1.78	2.10	2.36	1.90	1.95						
29	1.78	2.10	2.35		1.95		1.68			1.32	
30	1.80	2.15	2.32		1.92						
31		2.12	2.32		1.92						

TULARE LAKE BASIN.

TULARE LAKE, KINGS COUNTY, CAL.

Tulare Lake is about 30 miles directly south of Fresno and 40 miles northwest of Bakersfield. The lake is roughly rectangular in shape and its greatest length is northwest to southeast. In November, 1907, when its margin was carefully determined, the lake had an area of about 274 square miles, a maximum depth of 12.4 feet, an average length of 20 miles, and a width of 13.5 miles; the water's edge was 3 miles from the town of Corcoran, and the water surface about 12 feet below. The lake surface reached its greatest height in the summer of 1907, when its maximum depth was nearly 14 feet. Since July, 1907, it has been gradually subsiding.

The lake bed resembles a flat saucer. The flat, level area in the bottom is approximately 180 feet above mean sea level and about 55 square miles. The lowest point on the crest of the delta ridge to the north is about 27 feet higher than the bottom of the lake. Natural overflow will not occur, therefore, until the lake is nearly 30 feet deep and nearly 1,000 square miles in area.

During 1906 and a part of 1907 a record of the stage of the lake was obtained near the entrance of Kings River near Lemoore, Cal., at the middle of sec. 4, T. 21 S., R. 20 E. The zero of the gage was at 175.1 feet above mean sea level, or 4 feet below the bottom of the lake (elevation, 179.1 feet). May 11, 1907, a staff gage was set near Corcoran, Cal., referred to the same datum and used until July 30, 1909.

July 28, 1910, a vertical staff gage, in two sections, was installed on the section line just south of the corner to secs. 27, 28, 33, and 34, T. 20 S., R. 20 E., about 10 miles south of Lemoore near Stratford post office. The datum of this gage is 171 feet above

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sea level. August 20, 1913, a vertical staff in four sections was installed at same datum, in main north-and-south waterway 4 to 6 miles southeast of Stratford. Sections No. 1 and No. 2 are 1 mile south of 1910 gage, in sec. 3, T. 21 S., R. 20 E. No. 3 is in section 10 and No. 4 is in section 15, 1 and 2 miles, respectively, south of sections No. 1 and No. 2.

May 15, 1914, it was necessary to install a new gage on account of the rebuilding of the levees. It is a vertical staff in two sections, fastened to the headgate at corner of north-south and east-west levee on G. Albert Smith's ranch, at quarter corner between secs. 8 and 17, T. 21 S., R. 20 E., about 5 miles southwest of Stratford. The datum of this gage is 176.4 feet above sea level.

All published gage records have been reduced to show actual depth of the water on the lowest point of the lake bed.

The maximum stage recorded during 1913–14 was 2.7 feet July 5; the minimum was 0.8 feet September 27. For the period 1906–1914 the maximum stage recorded was 14.0 feet June 21, 1907, and the minimum zero March 15, 1906.

Depth, in feet, of Tulare Lake, Kings County, Cal., for the year ending Sept. 30, 1914.

[Mrs. G. E. Kolbenstetter, observer.]

Day.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept.
1						16					
2						17				2.0	
3				2.3		18					
4						19			2.7		
5		2.6	2.8			20					
6						21					0.9
7						22		2.3			
8					1.5	23	2.3			1.9	
9						24					
10				2.1		25					
11						26					
12			2.75			27					.8
13	1.85	2.5				28			2.3		
14					1.25	29			2.25		
15	2.15					30	2.3				
						31					

DEER CREEK AT HOT SPRINGS, CAL.

LOCATION.—Below footbridge at forest supervisor's headquarters in Sequoia National Forest, about half a mile below Hot Springs. Tyler Creek enters about 2½ miles below the station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 7, 1910, to September 30, 1914.

GAGE.—Vertical staff fastened to an alder tree on left bank 30 feet below footbridge. Observers, A. B. Patterson, W. J. Brown, and W. A. Robison.

DISCHARGE MEASUREMENTS.—Made from highway bridge, 100 feet below gage or by wading.

CHANNEL AND CONTROL.—Sand, gravel, and boulders.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.90 feet at 10 a. m. January 24 (discharge, 230 second-feet); minimum stage recorded, 0.30 foot a number of days in July to September (discharge 1.2 second-feet).

1910–1914: Maximum stage recorded, 2.90 feet at 10 a. m. January 24, 1914 (discharge, 230 second-feet); minimum stage recorded, 0.24 foot August 14 to 16, 1913 (discharge 0.8 second-foot.

DIVERSIONS.—Water is diverted for irrigation above the station.

ACCURACY.—Results considered approximate for high water and fair for medium and low stages. No discharge measurements were made at this station during the years ending September 30, 1914 and 1915. A measurement made in 1916 was

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l to help define the curve. Discharges for missing gage heights were estimated comparison with those of South Fork of Tule River near Portersville.
ATION.—Gage-height record furnished by United States Forest Service.

scharge, in second-feet, of Deer Creek at Hot Springs, Cal., for the year ending Sept. 30, 1914.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	2.1	3.6	4.6	29	e20	a 16	a 15	24	10	4.6	1.2	1.2
.....	2.2	16	4.6	12	18	a 15	a 14	23	13	4.6	a 1.2	a 1.2
.....	2.2	4.4	4.6	17	a 18	14	a 14	22	11	4.6	a 1.2	a 1.2
.....	2.2	4.0	4.6	10	a 17	a 14	14	20	11	4.6	a 1.2	1.2
.....	2.2	4.0	4.6	9.2	a 16	a 14	32	20	10	4.6	a 1.2	a 1.2
.....	2.5	4.0	5.1	a 8.0	a 15	a 14	23	20	16	4.4	a 1.2	a 1.2
.....	2.2	3.8	5.1	6.8	a 15	a 14	20	a 20	13	4.4	a 1.2	a 1.2
.....	2.2	3.4	5.1	6.8	a 14	e 14	20	a 19	12	4.4	a 1.2	1.2
.....	2.1	3.4	5.1	6.6	13	a 14	a 20	a 18	a 11	4.4	a 1.2	1.2
.....	2.2	3.4	5.1	a 6.6	a 12	14	52	18	10	a 4.4	a 3.0	1.2
.....	2.2	3.1	5.4	e 5.5	12	a 14	36	18	9.2	a 4.4	2.5	1.2
.....	2.2	3.1	4.6	e 5.5	a 12	a 14	29	18	9.8	a 4.3	2.7	1.2
.....	2.1	4.6	5.1	a 5.1	12	a 14	26	17	9.2	a 4.3	a 2.4	1.2
.....	2.1	2.9	8.0	a 5.1	a 11	a 14	a 28	17	8.9	a 4.3	2.0	1.2
.....	2.2	2.9	6.1	a 9.1	9.8	14	29	17	a 8.0	a 4.2	2.0	1.2
.....	2.2	2.7	5.6	9.8	a 10	a 14	26	17	7.1	a 4.2	a 1.9	1.2
.....	2.2	2.7	5.1	a 8.0	a 10	a 15	23	17	a 7.1	a 4.2	1.8	1.5
.....	2.4	2.9	4.9	a 35	14	a 15	23	18	a 7.2	a 4.1	1.8	1.5
.....	2.4	6.8	4.6	13	a 15	a 16	26	18	a 7.3	a 4.1	1.7	2.5
.....	2.5	5.1	4.6	9.5	a 16	16	23	15	7.4	a 4.1	a 1.5	2.5
.....	2.5	4.9	4.6	a 9.0	29	a 16	26	15	7.4	a 4.0	a 1.4	2.5
.....	2.7	4.6	14	118	a 18	a 17	26	14	a 7.0	4.0	a 1.3	1.8
.....	2.9	4.6	7.1	a 80	a 18	a 17	26	14	a 6.4	a 4.0	1.2	2.1
.....	2.9	4.4	5.8	230	a 16	a 18	23	a 14	a 5.8	a 4.0	a 1.2	2.1
.....	2.9	4.4	6.3	184	a 16	18	23	a 14	a 5.2	4.0	a 1.2	2.1
.....	2.9	4.4	e 5.6	a280	a 16	a 18	23	14	4.6	1.5	a 1.2	2.5
.....	3.1	4.6	4.9	58	a 16	a 17	a 23	13	4.6	1.5	1.2	2.5
.....	3.1	6.8	4.6	42	a 16	16	23	14	4.9	1.5	1.2	2.5
.....	3.4	4.9	4.6	a 24	.....	a 16	20	14	4.6	a 1.4	1.2	2.2
.....	3.4	6.3	23	a 23	.....	a 16	20	13	4.6	a 1.3	1.2	2.2
.....	3.4	.....	18	a 22	.....	a 15	.....	a 12	.....	1.2	1.2	.....

a Estimated by comparison with South Fork of Tule River.

—Discharge determined from a rating curve fairly well defined between 5 and 50 second-feet.

y discharge of Deer Creek near Hot Springs, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
.....	3.4	2.1	2.51	154	D.
er.....	16	2.7	4.56	271	D.
er.....	23	4.6	6.48	398	C.
.....	280	5.1	41.5	2,550	.....
y.....	29	9.8	15.2	844	.....
.....	18	14	15.3	941	.....
.....	52	14	24.2	1,440	C.
.....	24	12	17.0	1,050	C.
.....	16	4.6	8.44	502	D.
.....	4.6	1.2	3.73	229	.....
.....	3.0	1.2	1.54	95	.....
ier.....	2.5	1.2	1.66	99	D.
ie year.....	280	1.2	11.8	8,570	

TULE RIVER NEAR PORTERSVILLE, CAL.

ION.—In the NW. ¼ NW. ¼ sec. 25, T. 21 S., R. 28 E., below highway bridge near Farland ranch, about 1 mile above mouth of South Fork and 6 miles east of rtersville. North and Middle forks of Tule River unite about 9 miles above ation.

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DRAINAGE AREA.—266 square miles.

RECORDS AVAILABLE.—May 1, 1901, to September 30, 1914.

GAGE.—Staff in four sections on right bank, 100 feet below bridge; upper sections vertical; low-water section, inclined, fastened to posts. Observer, Mrs. Martha Brough.

DISCHARGE MEASUREMENTS.—Made from bridge above gage or by wading.

CHANNEL AND CONTROL.—Gravel and small boulders; shifts slightly during high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.8 feet at 12 p. m. January 25 (approximate discharge, computed from extension of rating curve, 6,600 second-feet); minimum stage recorded, 0.3 foot October 1 to 8 (discharge, 1.5 second-feet).

1901–1914: Maximum stage recorded, 10.8 feet at 12 p. m. January 25, 1914 (approximate discharge, computed from extension of rating curve, 6,600 second-feet); minimum stage recorded, 0.2 foot August 22, 1913 (discharge, 1 second-foot).

DIVERSIONS.—Several small irrigation ditches divert water above the station.

ACCURACY.—Rating curves fairly well defined except for high stages; at low and medium stages results are good.

Discharge measurements of Tule River near Portersville, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 19	H. J. Tompkins	0.62	5.7	Mar. 25	H. J. Tompkins	2.34	254
Feb. 13	Lasley Lee	2.29	177	May 27	....do	2.30	232

Daily discharge, in second-feet, of Tule River near Portersville, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.5	5.5	61	156	425	235	213	224	235	84	19	5
2	1.5	78	56	260	368	235	203	235	235	80	19	5
3	1.5	47	52	510	350	235	203	235	224	75	18	5
4	1.5	28	47	275	320	235	193	235	224	70	18	5
5	1.5	26	45	156	290	235	285	248	213	65	16	5
6	1.5	25	43	130	260	235	260	260	213	59	15	5
7	1.5	23	42	102	235	235	260	285	213	57	14	5
8	1.5	23	42	116	222	235	248	285	193	53	14	5
9	1.5	22	41	109	210	235	248	285	173	48	14	5
10	2	22	41	102	185	235	692	285	173	43	13	5
11	2	22	41	101	185	235	435	285	155	37	13	5.5
12	2	22	40	100	185	235	310	285	151	34	12	5.5
13	2.5	28	40	98	185	224	260	285	151	34	10	6
14	3	39	40	98	175	224	260	285	146	34	9	6
15	4	32	40	103	175	224	260	298	146	34	8	6.5
16	5	32	41	222	175	224	260	298	137	34	8	7
17	4.5	31	41	138	175	224	248	298	134	34	8	7
18	4	32	41	865	175	224	235	298	129	33	8	7.5
19	4.5	54	43	210	185	224	235	298	129	32	7.5	8
20	5	52	47	146	185	224	235	310	285	31	7.5	8
21	5	49	52	123	670	224	248	298	173	30	7	8
22	5	48	52	2,060	435	235	325	272	146	30	7	8
23	5	47	116	600	285	235	285	272	137	28	7	8
24	5	46	96	3,810	235	248	260	260	129	27	6.5	8
25	5	45	90	4,710	235	248	235	248	118	26	6	8
26	5	45	84	3,630	235	235	235	235	110	25	6	8
27	5	44	78	1,170	235	235	235	235	105	24	5.5	8
28	5	44	72	700	235	224	224	235	99	24	5	9
29	5	43	66	600	.....	235	224	248	94	23	5	9
30	5	66	130	510	.....	248	224	248	91	22	5	9
31	5	.....	385	465	.....	213	.....	235	.....	21	5	.....

NOTE.—Daily discharge determined from fairly well defined rating curves applicable Oct. 1, 1913, to Feb. 21, 1914, and Feb. 22 to Sept. 30, 1914. Discharge interpolated Sept. 20, 1914.

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Monthly discharge of Tule River near Porterville, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	5	1.5	3.45	212	C.
November	78	5.5	37.4	2,230	B.
December	385	40	67.9	4,180	B.
January	4,710	98	722	44,400	C.
February	670	175	258	14,300	B.
March	248	213	232	14,300	B.
April	692	193	268	15,900	B.
May	310	224	268	16,500	B.
June	285	91	162	9,640	B.
July	84	21	40.4	2,480	B.
August	19	5	10.2	627	B.
September	9	5	6.67	397	C.
The year	4,710	1.5	173	125,000	

BEAR CREEK NEAR SPRINGVILLE, CAL.

LOCATION.—At Bear Creek ranger station, in Sequoia National Forest, about 150 feet above mouth of Rancheria Creek, 2¾ miles above junction with North Fork of Tule River, and 6 miles northeast of Springville.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—January 23, 1911, to September 30, 1914 (not complete).

GAGE.—Vertical staff fastened to a sycamore tree on right bank about 600 feet southwest of ranger station. Observer, W. F. Derby.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Sand, gravel, and boulders; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.6 feet January 25 (discharge, 295 second-feet); minimum stage recorded, 4.1 feet October 12 to 18 and November 16 to 17 (discharge, 0.3 second-foot).

1911–1914: Maximum stage recorded, 5.6 feet January 25, 1914 (discharge, 295 second-feet); minimum stage recorded, 0.30 foot September 17, 1913 (discharge, 0.1 second-foot).

DIVERSIONS.—A small irrigation ditch heads about 300 feet above the station.

ACCURACY.—Rating curves fairly well defined except for high stages; discharge for days when gage was not read interpolated or estimated by comparison with records of other stations in the Tule drainage basin; results fair for low and medium stages.

COOPERATION.—Station maintained in cooperation with United States Forest Service.

No discharge measurements made in year.

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Daily discharge, in second-feet, of Bear Creek near Springville, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.4	1.4	2.5	55	13	7.0	5.3	5.3	2.3	1.8	0.6	0.
2	.4	8.2	3.0	15	10	7.0	5.0	5.6	2.3	1.7	.5	.
3	.4	5.0	3.5	10	9.0	7.0	5.0	5.3	2.3	1.6	.5	.
4	.4	3.0	4.4	5.6	8.0	6.9	5.0	5.0	2.3	1.5	.5	.
5	.4	2.0	4.3	5.7	7.0	6.9	13	4.8	2.4	1.4	.5	.
6	.4	1.0	4.2	5.7	5.8	6.9	8.8	4.6	2.5	1.3	.5	.
7	.4	.8	4.2	5.8	5.7	6.8	8.0	4.3	2.5	1.2	.4	.
8	.4	.7	4.2	5.6	5.6	6.8	8.0	4.3	2.5	1.1	.4	.
9	.4	.6	4.2	5.4	5.5	6.8	8.0	4.3	2.4	1.0	.4	.
10	.4	.6	4.2	5.2	5.4	6.8	25	4.2	2.4	1.0	.4	.
11	.4	.6	4.2	5.0	5.3	6.7	10	4.1	2.3	1.0	.4	.
12	.3	.6	4.2	4.8	5.3	6.5	5.3	4.0	2.3	1.0	.4	.
13	.3	2.2	4.2	4.6	5.3	6.5	5.3	3.9	2.2	.9	.4	.
14	.3	3.5	4.2	4.4	6.0	6.4	5.3	3.8	2.2	.9	.4	.
15	.3	1.0	4.2	5.0	6.5	6.2	5.3	3.7	2.0	.9	.4	.
16	.3	.3	4.2	12	7.0	6.0	5.3	3.6	2.0	.9	.4	.
17	.3	.3	4.2	8.0	7.7	5.8	5.3	3.6	2.0	.9	.4	.
18	.3	2.0	4.2	50	7.7	5.6	5.3	3.4	2.0	.8	.4	.
19	.4	3.0	4.5	12	8.0	5.6	5.3	3.3	2.0	.8	.4	.
20	.4	4.0	5.0	8.0	8.0	5.5	5.3	3.1	4.0	.8	.4	.
21	.5	4.0	6.0	122	30	5.4	5.3	3.0	2.5	.8	.4	.
22	.6	3.0	6.0	100	20	5.3	5.3	3.0	1.9	.8	.4	.
23	.7	2.5	12	27	10	5.3	5.3	2.9	1.9	.7	.4	.
24	.8	2.2	5.6	200	7.2	5.3	5.3	2.8	1.9	.7	.4	.
25	.8	2.2	5.6	295	7.2	5.3	5.3	2.7	1.9	.7	.4	.
26	.8	2.2	5.5	176	7.2	5.3	5.3	2.6	1.8	.7	.4	.
27	.9	3.0	5.4	30	7.2	5.3	5.3	2.5	1.8	.7	.4	.
28	1.0	4.0	5.3	30	7.2	5.3	5.3	2.4	1.8	.6	.5	.
29	1.1	3.0	6.0	29	.....	5.3	5.3	2.3	1.8	.6	.5	.
30	1.2	3.1	8.1	20	.....	13	5.3	2.3	1.8	.6	.6	.
31	1.4	.....	55	13	.....	5.6	.....	2.3	.....	.6	.6	.....

NOTE.—Daily discharge determined from 2 rating curves fairly well defined between 0.1 and 57 second-feet.

Monthly discharge of Bear Creek near Springville, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1.4	0.3	0.55	34	D.
November	8.2	.3	2.33	139	D.
December	55	2.5	6.53	402	C.
January	295	4.4	41.1	2,530	C.
February	30	5.3	8.49	472	C.
March	13	5.3	6.33	389	C.
April	25	5.0	6.73	400	C.
May	5.6	2.3	3.65	224	C.
June	4.0	1.8	2.20	131	D.
July	1.8	.6	.97	60	D.
August	.6	.4	.44	27	D.
September	.8	.6	.62	37	D.
The year	295	.3	6.69	4,840	

SOUTH FORK OF TULE RIVER NEAR PORTERSVILLE,[1] CAL.

LOCATION.—Opposite Indian school on Tule Indian Reservation, about 8 miles above junction with Tule River, 7 miles southeast of Success, and 14 miles southeast of Portersville. Rocky Creek enters about 2 miles above station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 10, 1910 to September 30, 1914.

[1] Station originally described as "near Success."

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:.—Vertical staff fastened to an alder tree on left bank 100 feet above pump ise. Observer, A. P. Edmonson.

IARGE MEASUREMENTS.—Made from cable half a mile below gage or by wading.

INEL AND CONTROL.—Boulders and gravel; rough; shifts slightly during high vater.

RSIONS.—Several small irrigation ditches, having a total capacity of about 11 ond-feet, divert water above the station.

EMES OF DISCHARGE.—1910–1914: Maximum stage recorded, 8.0 feet at 8 a. m. anuary 26, 1914 (approximate discharge, computed from extension of rating urve, 2,230 seond-feet); minimum stage recorded, zero August 4 to 16 and 18 to 6, September 11 to 22, and October 1, 1913 (discharge, 1 second-foot).

RACY.—Rating curve approximate above gage height 2 feet; below this stage esults are good.

ERATION.—Gage-height record furnished by United States Indian Service.

arge measurements of South Fork of Tule River, near Portersville, Cal., during the year ending Sept. 30, 1914.

	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
9	H. J. Tompkins.....	0.16	3	Mar. 25	H. J. Tompkins.....	1.40	61
3	Lasley Lee.....	1.30	55				

discharge, in second-feet, of South Fork of Tule River, near Portersville, Cal., for the year ending Sept. 30, 1914.

ay.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	1	3	13	81	130	86	58	86	45	18	4.3	3.4
.....	2	16	16	106	114	74	53	74	45	18	4.3	3.4
.....	2	8.9	14	106	114	74	53	74	45	18	4.3	3.4
.....	2	6.5	12	33	86	74	53	74	41	18	4.3	2.5
.....	2	7.1	11	33	80	68	68	68	39	18	2.5	2.5
.....	2	8	9.5	27	74	63	86	74	37	18	1.8	2.5
.....	2	7.1	9.5	27	74	63	74	74	41	14	1.2	2.5
.....	2	6.5	9.5	27	63	68	68	74	37	14	1.2	2.5
.....	2	6.5	9.5	16	74	68	63	74	37	14	1.2	2.5
.....	2	6.5	9.5	16	74	68	262	74	29	14	2.5	2.5
.....	2	6.5	9.5	12	68	68	138	74	23	14	1.8	2.5
.....	2	6.5	9.5	12	63	68	107	74	23	14	1.8	2.5
.....	2	8	9.5	9.5	63	68	100	74	23	14	2.5	2.5
.....	2	12	12	9.5	53	63	100	74	18	12	2.5	2.5
.....	2	9.5	13	49	53	63	100	74	18	10	2.5	2.5
.....	2	6.5	16	59	53	63	100	74	18	10	2.5	2.5
.....	2	6.5	14	33	53	63	100	74	18	10	2.5	2.5
.....	2	8	13	158	58	63	100	74	18	10	2.5	2.5
.....	2.2	12	12	81	74	63	100	63	18	6.8	2.5	2.5
.....	2.5	16	12	54	86	63	100	63	23	6.8	2.5	2.5
.....	2.5	16	12	45	217	63	100	63	29	6.8	2.5	2.5
.....	2.5	12	12	377	107	68	100	63	23	6.8	2.5	2.5
.....	2	9.5	16	206	100	74	93	63	18	6.8	2.5	2.5
.....	2	9.5	16	1,340	86	63	80	63	18	6.8	2.5	2.5
.....	2	9.5	14	1,340	86	63	74	53	18	6.8	1.8	2.5
.....	2	9.5	16	2,020	86	63	74	53	18	4.3	1.8	2.5
.....	2.2	12	16	750	86	63	74	53	18	4.3	1.8	2.5
.....	2.5	16	16	262	80	65	74	53	18	4.3	2.2	4.3
.....	3	14	59	146	.....	63	74	53	18	4.3	2.5	4.3
.....	3	19	87	146	.....	63	74	45	18	4.3	2.5	4.3
.....	3	.....	87	146	.....	63	.....	45	.....	4.3	2.5	.....

E.—Discharge determined as follows: Oct. 1, 1913, to Jan. 26, 1914, from a rating curve fairly well d between 2 and 80 second-feet; Jan. 27 to Sept. 30, 1914, from a rating curve fairly well defined en 2 and 90 second-*feet.*

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Monthly discharge of South Fork of Tule River near Portersville, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	3	1	2.14	132	C.
November	19	3	9.82	584	C.
December	87	9.5	18.9	1,160	C.
January	2,020	9.5	249	15,300	D.
February	217	53	84.1	4,670	B.
March	86	63	66.5	4,090	B.
April	262	53	90.0	5,360	B.
May	86	45	66.8	4,110	B.
June	45	18	26.4	1,570	B.
July	18	4.3	10.7	658	C.
August	4.3	1.2	2.46	151	C.
September	4.3	2.5	2.77	165	C.
The year	2,020	1	52.4	38,000	

KAWEAH RIVER NEAR THREE RIVERS, CAL.

LOCATION.—In the SE. ¼ sec. 27, T. 17 S., R. 28 E., at J. O. Carter ranch, 1¼ miles southwest of Three Rivers. North Fork enters about 3 miles and South Fork three-fourths of a mile above the station.

DRAINAGE AREA.—520 square miles.

RECORDS AVAILABLE.—April 29, 1903, to September 30, 1914.

GAGE.—Staff in three sections on left bank one-fourth mile back of observer's house. Vertical high-water section fastened to willow tree; inclined low-water section fastened to posts. United States Weather Bureau gage at same location and datum has been used, during certain periods, since December 5, 1912. Observer, J. O. Carter.

CHANNEL AND CONTROL.—Gravel and boulders; fairly permanent.

DISCHARGE MEASUREMENTS.—Made from cable at gage or by wading.

EXTREMES OF DISCHARGE.—1903–1914, maximum stage recorded, 13.0 feet at 10 p. m. January 25, 1914 (approximate discharge, computed from extension of rating curve, 13,300 second-feet); minimum stage recorded, 4.35 feet August 22, 1914 (discharge, 30 second-feet).

DIVERSIONS.—Several small ditches divert water for local irrigation and domestic use above the station. Power is also developed on the Middle and East forks.

ACCURACY.—Rating curve well defined; results excellent except for extremely high and low stages.

Discharge measurements of Kaweah River near Three Rivers, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 18	H. J. Tompkins	[a] 4.47	57	Mar. 28	H. J. Tompkins	6.24	708
Feb. 11	Lasley Lee	5.73	447				

[a] Weather Bureau gage reading.

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discharge, in second-feet, of Kaweah River near Three Rivers, Cal., for the year ending Sept. 30, 1914.

ay.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	56	48	114	1,000	720	605	605	815	2,160	1,220	242	83
.....	56	138	102	560	685	605	605	815	2,160	1,160	264	73
.....	56	162	98	755	620	575	740	938	1,920	1,070	253	73
.....	56	114	92	400	620	605	855	1,160	1,920	980	242	73
.....	54	85	92	347	593	638	1,160	1,360	1,800	895	253	73
.....	51	81	92	295	566	705	1,220	1,470	1,420	855	242	73
.....	51	81	92	268	539	778	1,020	1,690	1,320	815	225	63
.....	56	81	92	268	513	815	980	1,800	1,160	778	225	63
.....	56	72	92	240	487	855	980	1,920	1,160	778	203	63
.....	56	63	92	212	461	815	1,690	1,690	1,420	705	181	63
.....	56	72	81	205	435	855	1,160	1,580	1,470	670	159	63
.....	53	114	81	190	462	895	1,020	1,800	1,470	638	137	63
.....	50	125	81	184	462	895	1,070	1,920	1,470	638	115	63
.....	48	155	102	199	462	855	1,360	2,040	1,470	605	94	63
.....	48	130	102	268	462	855	1,470	1,920	1,260	575	73	63
.....	48	125	92	355	490	895	1,320	2,040	1,470	575	63	63
.....	48	102	92	283	435	980	1,260	2,040	1,470	575	63	60
.....	48	102	81	1,230	518	980	1,360	2,160	1,580	638	51	56
.....	48	145	81	450	435	1,070	1,580	2,290	1,470	638	42	63
.....	48	145	81	400	605	1,070	1,690	2,160	1,470	605	42	63
.....	48	155	102	307	1,470	1,070	1,690	2,040	1,360	544	35	63
.....	48	125	102	1,180	938	1,020	1,360	1,920	1,360	483	30	63
.....	48	107	130	830	815	1,020	1,260	1,920	1,420	422	35	60
.....	48	114	170	5,250	740	980	1,070	1,690	1,260	362	42	56
.....	48	107	145	9,880	670	938	980	1,690	1,160	362	48	60
.....	44	102	150	4,660	605	938	895	1,420	1,120	362	56	118
.....	44	102	155	1,920	575	855	855	1,580	1,160	362	63	125
.....	44	125	138	1,370	605	740	938	1,920	1,160	340	73	101
.....	44	107	120	1,090	.....	670	815	2,160	1,260	320	83	87
.....	44	125	162	958	.....	740	815	2,420	1,260	260	83	83
.....	44	.....	505	792	.....	638	.....	2,290	.....	260	79	.....

TE.—Discharge Oct. 12 and 13, Feb. 5–10, July 21–23, and Aug. 9–14 interpolated.

thly discharge of Kaweah River near Three Rivers, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 520 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
ber.....	56	44	49.9	0.096	0.11	3,070	B.
mber.....	155	48	110	.212	.24	6,550	B.
mber.....	505	81	120	.231	.27	7,380	B.
ary.....	9,880	184	1,170	2.25	2.59	71,900	B.
uary.....	1,470	435	607	1.17	1.22	33,700	B.
h.....	1,070	575	837	1.61	1.86	51,500	A.
l.....	1,690	605	1,130	2.17	2.42	67,200	A.
.....	2,420	815	1,760	3.38	3.90	108,000	A.
.....	2,160	1,120	1,450	2.79	3.11	86,300	A.
.....	1,220	260	629	1.21	1.40	38,700	A.
ust.....	264	30	122	.235	.27	7,500	B.
ember.....	125	56	71.2	.137	.15	4,240	B.
The year.....	9,880	30	672	1.29	17.54	486,000	

MARBLE FORK OF KAWEAH RIVER NEAR RANGER, CAL.

IATION.—In the SE. ¼ NE. ¼ sec. 35, T. 15 S., R. 29 E., at highway bridge in Sequoia National Park, about 1½ miles northwest of Ranger.

AINAGE AREA.—Not measured.

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RECORDS AVAILABLE.—July to December 17, 1913 (fragmentary).

GAGE.—Vertical staff fastened to rock ledge on right bank underneath bridge.

DISCHARGE MEASUREMENTS.—Made by wading just above control, 75 feet below gage.

CHANNEL AND CONTROL.—Large boulders and gravel; rough.

EXTREMES OF DISCHARGE.[1]—Maximum stage recorded during year, 6.8 feet December 5, 6, and July 29 (discharge, 48 second-feet); minimum stage recorded 5.5 feet October 3, 7, and 15 to 25 (discharge, 7 second-feet).

1913–1914: Maximum stage recorded, 6.8 feet July 29, December 5, 6, 1913 (discharge, 48 second-feet); minimum stage recorded, September 27, 1902 (discharge, 4 second-feet; a miscellaneous measurement).

ACCURACY.—Rating curve fairly well defined; results good for days on which gage was read.

COOPERATION.—Gage-height record furnished by Walter Fry, acting superintendent of Sequoia National Park.

The following discharge measurement was made by H. J. Tompkins:

October 15, 1913: Gage height, 5.43 feet; discharge, 5.9 second-feet.

Daily discharge, in second-feet, of Marble Fork of Kaweah River, near Ranger, Cal., of the year ending Sept. 30, 1914.

Day.	Oct.	Dec.	Day.	Oct.	Dec.	Day.	Oct.	Dec.
1			11			21	7	
2			12			22		
3	7		13			23	7	
4			14			24		
5	9	48	15	7		25	7	
6		48	16	7		26		
7	7		17	7	31	27		
8		43	18			28		
9		39	19			29		
10			20			30		
						31		

NORTH FORK OF KAWEAH RIVER AT KAWEAH, CAL.

LOCATION.—In the SW. ¼ sec. 2, T. 17 S., R. 28 E, at highway bridge, about half a mile north of Kaweah and 2 miles above junction with Kaweah River. Sheep Creek enters 2½ miles above and Manikin Creek one-fourth mile below gage.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 12, 1910, to September 30, 1914.

GAGE.—Vertical staff fastened to right abutment of bridge was damaged by flood in January, 1914; present staff is in two sections on right bank; low-water section is inclined and fastened to abutment of bridge; upper section is vertical and fastened to sycamore tree 20 feet below bridge. Observer, J. T. Weckert.

DISCHARGE MEASUREMENTS.—Made from bridge at gage or by wading.

CHANNEL AND CONTROL.—Solid rock and sand; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.2 feet at 7 p. m. January 25 (approximate discharge, computed from extension of rating curve, 7,400 second-feet); minimum stage recorded, 0.47 foot August 29 to 31 and September 7 and 13 to 19 (discharge, 1 second-foot).

1910–1914: Maximum stage recorded, 10.2 feet at 7 p. m. January 25, 1914 (approximate discharge, 7,400 second-feet); minimum stage recorded, 0.35 foot August 27, 1913 (discharge, 0.8 second-foot).

DIVERSIONS.—Approximately 20 second-feet is diverted by several small ditches for irrigation above the station.

ACCURACY.—Rating curves fairly well defined except at high stages; results good.

[1] Record very incomplete.

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rge measurements of North Fork of Kaweah River at Kaweah, Cal., during the year ending Sept. 30, 1914.

	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
12	Lasley Lee	1.75	122
30	H. J. Tompkins	2.02	209

y discharge, in second-feet, of North Fork of Kaweah River at Kaweah, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	2	1	17	460	235	200	179	218	193	47	10	2
.....	2	16	14	152	200	193	182	218	179	44	10	2
.....	2	19	14	225	186	193	235	218	165	42	10	2
.....	2	10	12	115	172	190	243	218	172	41	8	2
.....	2	8	12	79	159	196	512	255	159	39	6	2
.....	2	8	12	62	138	200	594	255	153	36	6	2
.....	2	8	12	59	133	539	360	275	144	33	5	1
.....	2	8	14	55	130	275	315	295	135	32	5	2
.....	2	7	12	46	124	255	315	315	130	30	4	2
.....	2	7	12	42	133	255	622	295	121	31	4	2
.....	2	7	11	40	121	275	385	275	108	25	4	2
.....	2	7	11	38	124	295	315	295	104	25	4	2
.....	2	11	12	37	119	275	360	275	101	24	4	1
.....	2	17	12	38	124	295	385	295	97	23	4	1
.....	2	13	12	70	124	275	360	295	93	22	3	1
.....	2	11	12	124	119	295	338	295	90	22	3	1
.....	2	9	12	79	112	315	338	275	93	22	3	1
.....	3	9	12	512	141	295	360	275	90	22	2	1
.....	3	20	13	128	147	315	338	275	85	21	2	1
.....	2	23	13	88	196	338	338	295	83	20	2	2
.....	2	21	15	78	385	315	338	275	80	19	2	2
.....	2	20	16	435	338	315	315	255	71	18	2	2
.....	2	16	42	260	255	295	295	218	70	16	2	2
.....	2	13	59	2,170	235	275	275	218	67	15	2	2
.....	2	14	46	5,380	218	275	235	218	63	15	2	2
.....	2	14	35	1,680	200	275	235	200	61	14	2	2
.....	1	14	29	744	196	255	235	200	57	13	2	4
.....	1	14	26	460	193	235	235	200	53	12	2	3
.....	1	14	25	360	.....	218	218	186	51	11	1	3
.....	1	16	46	315	.....	200	218	186	49	11	1	3
.....	1	.....	152	295	.....	186	.....	190	.....	10	1	.....

TE.—Discharge determined from 2 fairly well defined rating curves applicable Oct. 1 to Jan. 25 and 26 to Sept. 30.

ıthly discharge of North Fork of Kaweah River at Kaweah, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
ober	3	1	1.9	117	C.
ember	23	1	12.5	744	B.
ember	152	11	23.9	1,470	B.
nary	5,380	37	472	29,000	B.
ruary	385	112	177	9,830	B.
rch	539	186	268	16,500	B.
ril	622	179	322	19,200	B.
y	315	186	250	15,400	B.
e	193	49	104	6,190	B.
y	47	10	24.4	1,500	B.
gust	10	1	3.81	234	C.
tember	4	1	1.9	113	C.
The year	5,380	1	138	100,000	

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SOUTH FORK OF KAWEAH RIVER NEAR THREE RIVERS, CAL.

LOCATION.—In the SE. ¼ sec. 8, T. 18 S., R. 29 E., on Mehrton ranch, 500 feet above mouth of Cinnamon Creek, 4½ miles southeast of Three Rivers and about 5 miles above junction with Kaweah River.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 18, 1911, to September 30, 1914.

GAGE.—Vertical staff fastened to large bowlder on right bank. Observer, D. N. Mehrton.

DISCHARGE MEASUREMENTS.—Made from cable 300 feet above gage or by wading.

CHANNEL AND CONTROL.—Gravel and boulders; rough; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.8 feet January 25 (discharge, 1,460 second-feet); minimum stage recorded, 1.9 feet October 10 to 16 and 19 to November 1 (discharge, 4.5 second-feet).

1911–1914: Maximum stage recorded, 5.8 feet January 25, 1914 (discharge, 1,460 second-feet); minimum stage recorded, 1.82 feet October 1, 1912 (discharge, 3.3 second-feet).

DIVERSIONS.—Two small ditches divert water for irrigation above the station.

ACCURACY.—Rating curves fairly well defined; results good except for high stages.

Discharge measurements of South Fork of Kaweah River near Three Rivers, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 18	H. J. Tompkins.....	1.92	4.9	Mar. 29	H. J. Tompkins.....	3.08	62
Feb. 11	Lasley Lee.....	2.89	48	May 28	.....do.....	4.12	364

Daily discharge, in second-feet, of South Fork of Kaweah River near Three Rivers, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1.....	5	4.5	12	90	74	67	67	123	400	119	13	6
2.....	5.5	24	11	118	82	67	67	136	355	112	12	6
3.....	5.5	21	11	166	82	67	70	140	400	105	12	6
4.....	6	18	11	118	74	67	70	148	445	82	12	6
5.....	6	15	10	90	74	67	168	224	400	74	11	6
6.....	6.5	8	9.5	46	67	67	101	266	277	67	11	6
7.....	6	8	9.5	26	67	67	103	304	241	56	11	6
8.....	5.5	8	9.5	26	67	67	105	315	207	47	10	6.5
9.....	5	7.5	9.5	30	56	67	105	315	214	43	10	6.5
10.....	4.5	7.5	9.5	26	52	67	378	315	270	43	9.5	6.5
11.....	4.5	7.5	9.5	26	47	67	259	315	266	39	9	6.5
12.....	4.5	8	9.5	26	45	67	241	335	259	36	9	6.5
13.....	4.5	11	9.5	24	45	68	207	400	224	33	9	6.5
14.....	4.5	15	10	24	44	70	182	400	266	32	8.5	6.5
15.....	4.5	14	9.5	33	44	72	192	315	217	32	8	6.5
16.....	4.5	13	10	56	43	73	201	335	224	32	8	6
17.....	5	11	10	33	43	74	234	378	207	36	39	6
18.....	5	11	10	272	43	79	266	445	217	32	32	6
19.....	4.5	19	10	56	47	82	192	400	224	32	24	6
20.....	4.5	13	10	33	45	86	176	422	315	27	19	6
21.....	4.5	13	10	33	176	90	162	445	241	24	13	6
22.....	4.5	12	12	99	148	95	162	422	234	22	12	8
23.....	4.5	12	13	290	123	97	156	400	224	21	9	8
24.....	4.5	12	15	496	112	101	148	378	192	21	6	9
25.....	4.5	12	17	1,460	108	112	116	355	162	20	6	9
26.....	4.5	11	15	690	101	136	112	335	148	19	6	10
27.....	4.5	11	13	296	92	82	112	304	148	18	6	11
28.....	4.5	11	13	259	82	74	110	355	162	16	6	11
29.....	4.5	11	15	192	.....	67	108	445	140	15	6	11
30.....	4.5	12	19	136	.....	72	116	445	123	14	6	11
31.....	4.5	.....	56	86	.....	68	.....	445	.....	13	6	.....

NOTE.—Discharge determined from two fairly well defined rating curves applicable Oct. 1 to Jan 25, and Jan. 26 to Sept. 30.

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Monthly discharge of South Fork of Kaweah River near Three Rivers, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	6.5	4.5	4.87	299	B.
November	24	4.5	12.0	714	B.
December	56	9.5	12.9	793	B.
January	1,460	24	173	10,600	C.
February	176	43	74.4	4,130	B.
March	136	67	77.5	4,770	B.
April	378	67	156	9,280	B.
May	445	123	334	20,500	B.
June	445	123	247	14,700	B.
July	119	13	41.4	2,550	B.
August	39	6	11.6	713	B.
September	11	6	7.27	433	B.
The year	1,460	4.5	96.0	69,500	

KINGS RIVER NEAR SANGER, CAL.

LOCATION.—In the NW. ¼ sec. 8, T. 13 S., R. 24 E., about half a mile below new highway bridge at Piedra, near mouth of canyon, southwest of Red Mountain, and about 12 miles northeast of Sanger.

DRAINAGE AREA.—1,740 square miles.

RECORDS AVAILABLE.—September 3, 1895, to September 30, 1914.

GAGE.—Friez water-stage-recorder on right bank; instrument was removed by the flood in January, 1914, and has not been replaced; auxiliary staff gage in two sections just above recording gage; the United States Weather Bureau gage on opposite bank at same datum read on and after January 30, 1914. Observers, O. G. Williams and A. V. Waugh.

DISCHARGE MEASUREMENTS.—Made from cable 500 feet below gage.

CHANNEL AND CONTROL.—Gravel and small boulders; shifts during high water.

EXTREMES OF DISCHARGE.—Maximum stage during year, 21.8 feet during the night of January 25, determined by leveling from flood marks by E. A. Bailey, engineer flood control of State of California (approximate discharge, computed from extension of rating curve 59,700 second-feet); minimum stage recorded, 4.24 feet October 27–28 (discharge, 186 second-feet).

1895–1914: Maximum stage, 21.8 feet during night of January 25, 1914 (approximate discharge, 59,700 second-feet); minimum stage recorded, 3.7 feet January 21, 1904 (discharge, 130 second-feet).

DIVERSIONS.—Several miles above the station there is a small diversion for a flume used to float lumber to Sanger.

ACCURACY.—After recording gage was removed by flood staff gage was read twice daily, except during low water, when it was read once daily. Rating curves well defined; results excellent.

Discharge measurements of Kings River near Sanger, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 10	Lasley Lee	5.72	1,360	Mar. 31	H. J. Tompkins	6.78	2,260
Mar. 28	Charles Leidl	7.19	2,810	May 11	R. C. Rice	10.15	7,860

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Daily discharge, in second-feet, of Kings River near Sanger, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	280	190	349	3,050	2,140	2,140	2,240	3,010	14,200	10,900	2,770	720
2	295	255	316	2,000	2,140	2,140	2,140	3,400	14,900	10,600	2,770	720
3	295	396	300	2,610	2,040	1,940	2,140	3,530	11,500	9,700	2,770	665
4	265	360	280	1,400	1,420	1,940	3,270	3,810	12,500	9,700	2,770	665
5	255	316	270	1,100	1,420	1,940	6,120	6,550	11,500	8,650	2,550	640
6	255	295	275	937	1,420	1,940	5,130	6,990	9,150	8,650	2,550	615
7	255	290	295	848	1,200	1,940	4,110	8,650	8,150	9,400	2,550	615
8	255	280	295	802	1,200	2,340	4,270	9,150	8,900	8,150	2,550	565
9	255	255	280	742	1,200	2,770	3,810	8,650	5,910	7,900	2,550	520
10	285	255	280	655	1,200	2,770	5,130	8,650	7,900	6,550	2,550	520
11	270	255	270	676	1,200	2,770	4,270	8,150	8,650	6,550	2,340	475
12	232	332	270	627	1,200	3,140	3,810	9,460	8,150	5,910	2,340	475
13	232	384	260	1,580	1,200	3,140	4,270	10,600	9,400	5,910	2,340	475
14	214	426	265	1,300	1,200	2,770	5,320	10,300	10,300	5,910	2,240	475
15	210	396	285	1,760	1,200	2,770	6,770	10,300	8,650	5,710	2,240	410
16	210	360	280	2,210	1,200	3,400	5,130	11,500	10,300	4,600	2,140	390
17	214	344	270	1,850	1,200	3,530	5,130	10,600	11,500	4,600	1,670	390
18	210	354	265	6,770	1,420	3,530	5,910	11,800	12,800	4,600	1,580	390
19	216	440	246	2,210	1,760	3,530	5,910	12,500	10,000	6,330	1,580	390
20	250	446	260	1,580	2,140	3,810	6,330	12,800	10,000	4,270	1,280	390
21	245	459	265	1,440	8,900	3,810	6,770	10,900	10,300	3,810	1,200	390
22	245	384	349	5,110	3,530	3,810	4,950	9,700	10,600	3,270	1,140	390
23	232	338	530	3,680	2,140	3,810	4,110	10,900	10,600	3,270	1,070	390
24	232	332	390	9,150	2,550	3,810	3,270	10,300	9,400	3,270	1,000	390
25	210	332	606	22,000	2,550	3,810	3,270	9,150	8,150	3,270	885	520
26	194	349	571	30,400	2,140	3,810	3,270	8,400	8,150	3,140	885	2,660
27	186	338	478	10,900	2,140	3,810	3,140	8,900	8,150	3,140	885	2,140
28	186	360	472	5,510	2,140	2,550	3,140	11,200	9,400	3,400	885	1,140
29	190	332	472	3,200	.....	2,440	3,010	13,500	10,900	3,010	830	1,000
30	190	384	511	2,770	.....	2,550	3,010	14,900	10,900	2,770	775	885
31	190	.....	1,440	2,140	.....	2,340	.....	14,900	.....	2,550	748	.....

NOTE.—Discharge determined from 2 fairly well defined curves applicable Oct. 1 to Jan. 26 and Jan. 27 to Sept. 30.

Monthly discharge of Kings River near Sanger, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 1,740 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	295	186	234	0.134	0.15	14,400	A.
November	459	190	341	.196	.22	20,300	A.
December	1,440	246	377	.217	.25	23,200	A.
January	30,400	627	4,230	2.43	2.80	260,000	B.
February	8,900	1,200	1,970	1.13	1.18	109,000	B.
March	3,810	1,940	2,930	1.68	1.94	180,000	A.
April	6,770	2,140	4,300	2.47	2.76	256,000	A.
May	14,900	3,010	9,460	5.44	6.27	582,000	A.
June	14,900	5,910	10,000	5.75	6.42	595,000	A.
July	10,900	2,550	5,790	3.33	3.84	356,000	A.
August	2,770	748	1,820	1.05	1.21	112,000	A.
September	2,660	390	680	.391	.44	40,500	A.
The year	30,400	186	3,520	2.02	27.48	2,550,000	

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DINKEY CREEK NEAR OCKENDEN, CAL.

LOCATION.—In the NE. ¼ sec. 20, T. 10 S., R. 26 E., above trail bridge at Dinkey Creek ranger station, in Sierra National Forest, about 11 miles above junction with North Fork of Kings River, and about 9½ miles southeast of Ockenden. Rock Creek enters 3 miles above and Bear Creek 1½ miles below the station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 17, 1910, to September 30, 1914 (fragmentary).

GAGE.—Vertical staff on right bank about 400 feet below ranger station.

DISCHARGE MEASUREMENTS.—Made from cable or by wading.

CHANNEL AND CONTROL.—Gravel and small boulders; fairly permanent.

EXTREMES OF STAGE.—Maximum stage recorded during year, 3.2 feet May 18; minimum stage recorded, 0.5 foot September 25.

1911–1914: Maximum stage recorded, 3.3 feet June 13 and 17, 1911; minimum stage recorded, 0.3 foot August 24 and 31, September 2, 8, 15, 20, and 24 to 31, 1912, and September 28, 1913.

COOPERATION.—Station maintained (summer months only) in cooperation with United States Forest Service.

No current-meter measurements made within the year; estimates of discharge not prepared.

Daily gage height, in feet, of Dinkey Creek near Ockenden, Cal., for the year ending Sept. 30, 1914.

[Roy Boothe, observer.]

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1				1.75			16		3.05	2.2			
2							17		3.15	2.9			
3					0.7		18		3.2	2.3			
4							19		3.0				
5	1.8			1.5			20						
6							21				1.0		
7							22				.9		
8			2.6				23				.9		
9			2.45		.7		24				.8		
10			2.3	1.3			25				.8		.5
11			2.4			0.6	26						
12			2.4				27						
13			2.4				28				.8		
14			2.2				29						.6
15			2.0		.6		30						
							31						

SAN JOAQUIN RIVER BASIN.

SAN JOAQUIN RIVER NEAR SHAVER, CAL.

LOCATION.—In N. ½ sec. 27, T. 8 S., R. 24 E., about 500 feet above junction with Big Creek, 5 miles northwest of Shaver.

DRAINAGE AREA.—785 square miles (measured by Pacific Light & Power Corporation).

RECORDS AVAILABLE.—August 11, 1912, to September 30, 1914.

GAGE.—Storrow seven-day water-stage recorder on left bank.

DISCHARGE MEASUREMENTS.—Made from cable near gage.

CHANNEL AND CONTROL.—Rough broken rock; not likely to change.

EXTREMES OF DISCHARGE.—1912–1914, maximum mean daily discharge, 9,900 second-feet, January 26, 1914; minimum, 91 second-feet, January 8, 1913.

ACCURACY.—Rating curve is well defined; results considered good.

COOPERATION.—Complete record furnished for publication by Pacific Light & Power Corporation, through R. C. Starr, hydraulic engineer.

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Daily discharge, in second-feet, of San Joaquin River near Shaver, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	280	202	306	1,980	2,080	1,880	2,000	2,680	7,800	5,570	2,180	800
2	260	230	302	1,840	1,860	1,920	2,110	2,810	7,930	5,570	2,460	780
3	254	284	318	1,820	1,730	1,850	2,300	3,050	6,560	5,340	2,480	770
4	254	271	296	1,400	1,600	1,820	2,680	3,700	6,560	5,220	2,390	745
5	251	243	288	1,240	1,500	1,920	5,570	4,250	6,060	4,900	2,310	710
6	243	251	324	1,050	1,420	2,080	4,900	4,150	5,120	4,680	2,370	700
7	240	247	314	935	1,380	2,180	4,130	4,790	4,250	4,680	2,370	680
8	254	230	322	930	1,320	2,250	4,020	5,010	4,020	4,440	2,240	650
9	248	227	300	760	1,310	2,370	3,800	4,900	3,810	4,240	2,210	610
10	243	226	288	645	1,250	2,400	4,800	4,570	4,130	3,920	2,300	570
11	236	296	290	653	1,260	2,400	4,580	4,570	4,250	3,820	2,200	535
12	226	393	288	656	1,300	2,460	4,140	4,800	4,250	3,820	2,050	490
13	221	362	270	1,560	1,300	2,460	4,140	5,120	4,450	3,710	1,950	495
14	213	385	306	1,020	1,300	2,450	4,440	5,350	5,120	3,710	1,900	480
15	208	356	294	1,550	1,300	2,420	4,900	5,190	5,240	3,710	1,820	470
16	204	327	280	1,320	1,300	2,580	4,800	5,840	5,570	3,600	1,740	455
17	200	313	274	1,370	1,340	2,850	4,450	5,570	6,070	3,710	1,660	450
18	200	320	290	2,450	1,450	2,970	4,450	5,920	6,820	3,710	1,580	445
19	198	430	238	1,130	1,830	3,000	4,800	6,060	6,070	3,600	1,500	515
20	192	428	264	1,340	2,470	2,850	5,120	6,060	6,320	3,420	1,420	660
21	192	430	256	1,240	5,000	3,040	5,000	5,910	5,920	3,190	1,340	570
22	192	336	446	1,800	3,366	3,180	4,240	5,580	6,070	2,950	1,260	510
23	190	292	376	2,060	2,660	3,270	3,610	5,840	6,070	2,760	1,180	490
24	186	328	357	2,190	2,290	3,180	3,220	5,350	5,570	2,800	1,120	475
25	184	352	516	7,300	2,100	2,960	3,050	4,800	4,790	2,800	1,060	720
26	180	358	468	9,900	2,010	2,880	3,020	4,450	4,350	2,800	1,020	1,800
27	180	348	436	4,630	1,900	2,730	2,880	4,900	4,680	2,700	980	1,410
28	188	380	460	3,290	1,860	2,460	2,780	5,820	5,120	2,800	930	1,080
29	180	310	500	2,650	.....	2,230	2,750	6,420	5,490	2,680	910	853
30	180	372	640	2,480	.....	2,150	2,680	7,210	5,820	2,440	850	807
31	184	.....	1,750	2,300	.....	2,080	.....	7,210	.....	2,310	810	.....

Monthly discharge of San Joaquin River near Shaver, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 785 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
October	280	180	215	0.274	0.32	13,200
November	430	202	318	.405	.45	18,900
December	1,750	238	389	.496	.57	23,900
January	9,900	645	2,110	2.69	3.10	130,000
February	5,000	1,250	1,840	2.34	2.44	102,000
March	3,270	1,820	2,490	3.17	3.66	153,000
April	5,570	2,000	3,850	4.90	5.47	229,000
May	7,210	2,680	5,100	6.50	7.49	314,000
June	7,930	3,810	5,480	6.98	7.79	326,000
July	5,570	2,310	3,730	4.75	5.48	229,000
August	2,480	810	1,690	2.15	2.48	104,000
September	1,800	445	698	.889	.99	41,500
The year	9,900	180	2,330	2.97	40.24	1,680,000

NOTE.—Monthly and yearly discharge computed by engineers of U. S. Geological Survey.

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SAN JOAQUIN RIVER NEAR NORTH FORK, CAL.

LOCATION.—In sec. 18, T. 9 S., R. 23 E., below San Joaquin Light & Power Corporation's power house, about 6 miles below mouth of North Fork Creek and 6 miles southeast of North Fork.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—April 1, 1910, to September 30, 1914.

GAGE.—Watson water-stage recorder on left bank, 1,000 feet below power house; also staff gage on right bank at cable.

DISCHARGE MEASUREMENTS.—Made from cable near gage.

CHANNEL AND CONTROL.—Boulders and gravel; apparently permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, January 25 [1] (discharge, 44,300 second-feet); minimum stage recorded, October 26 [1] (discharge, 142 second-feet).

1910–1914: Maximum stage recorded, January 31, 1911 [1] (discharge, 55,000 second-feet); minimum stage recorded, January 7, 1913 [1] (discharge, 135 second-feet).

STORAGE.—The power plant uses water from Crane Valley reservoir on North Fork Creek. The record at this station shows the total run-off from the drainage area above the station.

COOPERATION.—Daily-discharge record furnished by San Joaquin Light & Power Corporation.

Daily discharge, in second-feet, of San Joaquin River near North Fork, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	236	288	450	9,650	2,660	2,580	3,260	4,000	19,500	12,300	3,180	880
2	236	257	246	4,370	2,270	2,580	3,260	4,290	19,900	12,200	3,180	880
3	236	250	253	5,160	1,980	2,540	3,620	5,040	14,100	11,400	3,460	850
4	232	239	232	3,400	1,860	2,520	4,240	6,840	14,800	11,500	3,340	830
5	198	215	253	2,380	1,740	2,560	12,400	8,080	13,100	9,700	3,180	810
6	218	171	300	1,280	1,640	2,880	9,350	8,510	9,650	9,250	3,160	734
7	232	201	354	1,090	1,600	3,180	7,700	10,000	8,220	8,900	3,280	716
8	218	195	327	1,030	1,410	3,680	7,180	10,700	7,340	8,240	3,240	700
9	242	201	323	970	1,480	3,880	6,710	10,100	6,820	7,920	3,180	676
10	211	280	318	790	1,440	3,940	11,000	9,150	7,300	7,090	3,260	652
11	211	288	296	612	1,450	3,960	8,080	8,820	7,860	6,530	3,140	644
12	177	440	327	638	1,520	4,080	7,180	10,100	8,080	6,710	2,740	612
13	201	390	331	2,480	1,540	4,080	7,140	11,400	8,280	6,580	2,500	612
14	186	405	336	1,660	1,510	4,040	8,010	11,800	10,400	6,480	2,270	606
15	186	381	260	2,560	1,510	4,040	9,850	10,800	10,500	6,400	2,180	606
16	186	415	331	2,140	1,510	4,200	8,510	12,800	11,700	6,170	2,000	580
17	177	345	304	1,730	1,520	4,770	7,790	11,800	13,200	6,280	2,030	580
18	180	372	340	7,360	1,690	5,180	7,590	13,500	15,200	6,300	1,960	510
19	180	450	284	1,910	2,280	5,270	8,650	13,400	12,800	6,080	1,780	1,090
20	183	415	340	1,500	2,960	5,270	9,850	13,700	14,200	5,720	1,550	780
21	159	455	288	1,480	10,800	5,360	8,880	13,100	15,700	5,180	1,480	743
22	159	395	381	9,100	6,780	5,630	7,380	12,300	13,500	4,820	1,320	668
23	168	318	465	4,390	4,540	5,790	5,990	12,700	13,400	4,180	1,220	638
24	165	358	354	6,520	3,080	5,810	5,160	11,200	11,600	4,140	1,150	585
25	165	349	570	44,300	2,800	5,450	4,610	9,820	9,450	4,140	1,150	580
26	142	381	530	16,600	2,580	5,180	4,370	9,020	8,380	4,180	1,080	5,040
27	162	372	430	6,730	2,460	4,880	4,330	10,400	9,380	4,080	1,070	2,320
28	156	420	490	5,380	2,460	4,410	4,080	13,400	10,400	3,960	1,050	1,440
29	186	349	490	3,860	.....	3,920	4,080	15,800	14,900	4,080	1,010	1,080
30	475	410	530	3,560	.....	3,660	3,960	18,600	15,800	3,660	930	980
31	359	.....	2,360	3,360	.....	3,460	.....	19,000	.....	3,280	890	.....

[1] Gage height not reported.

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Monthly discharge of San Joaquin River near North Fork, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	475	142	207	12,700
November	455	171	334	19,900
December	2,360	232	422	25,900
January	44,300	612	5,100	314,000
February	10,800	1,410	2,540	141,000
March	5,810	2,520	4,150	255,000
April	12,400	3,260	6,810	405,000
May	19,000	4,000	11,000	676,000
June	19,900	6,820	11,800	702,000
July	12,300	3,280	6,690	411,000
August	3,460	890	2,160	133,000
September	5,040	510	947	56,400
The year	44,300	142	4,360	3,150,000

NOTE.—Monthly and yearly discharge computed by engineers of U. S. Geological Survey.

SAN JOAQUIN RIVER NEAR FRIANT, CAL.

LOCATION.—In the SE. ¼ sec. 34, T. 10 S., R. 21 E., at Fort Miller ranch, about 4 miles above Friant. November 9, 1913, station was moved 2 miles downstream to NW. ¼ sec. 5, T. 11 S., R. 21 E., about 1½ miles northeast of Friant.

DRAINAGE AREA.—1,640 square miles at Fort Miller station.

RECORDS AVAILABLE.—October 18, 1907, to September 30, 1914.

GAGE.—Staff in three sections on left bank; at new site staff is in two sections on left bank 10 feet upstream from intake for Gurley weight-driven water-stage recorder, installed December 9, 1913.

DISCHARGE MEASUREMENTS.—Made from cable at Fort Miller ranch or by wading.

CHANNEL AND CONTROL.—At the cable the section is sand and gravel which shifts during high water; at the new site the control is a solid rock dike which extends across the channel about 500 feet below gage.

EXTREMES OF DISCHARGE.—1907-1914: Maximum stage, 21.7 feet at 11.30 p. m. January 25, 1914 (discharge, 46,200 second-feet); minimum stage recorded, 3.25 feet October 17 to 19 and 22 to 29, 1913 (discharge, 170 second-feet).

DIVERSION AND STORAGE.—Some storage and power developed above the station. (See San Joaquin River near North Fork.) The Fresno Flume & Irrigation Co. diverts about 10 second-feet from Stevenson Creek for irrigation near Clovis.

ACCURACY.—Rating curve for new station well defined below 20,000 second-feet; results excellent.

Discharge measurements of San Joaquin River near Friant, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height. (a)	Gage height. (b)	Discharge.	Date.	Made by—	Gage height. (a)	Gage height. (b)	Discharge.
		Feet.	*Feet.*	*Sec.-ft.*			*Feet.*	*Feet.*	*Sec.-ft.*
Nov. 6	Charles Leidl	3.40	3.38	253	May 10	R. C. Rice	8.84	10.48	8,630
Dec. 10	do	3.61	3.90	398	16	do	10.22	11.61	11,200
Feb. 9	Lasley Lee	4.62	5.94	1,500	June 3	do	10.78	12.07	13,100
Mar. 29	Charles Leidl	5.90	7.70	3,050					

a Gage at cable. b Water-stage recorder.

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arge, in second-feet, of San Joaquin River near Friant, Cal., for the year ending Sept. 30, 1914.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
...	255	320	478	4,260	2,870	2,540	2,760	4,080	15,400	10,400	3,310	1,020
...	255	320	391	2,650	2,540	2,600	2,990	4,430	15,700	10,400	3,530	990
...	225	320	313	3,840	2,260	2,500	3,380	4,890	12,600	9,910	3,680	990
...	225	307	328	2,000	2,080	2,440	4,170	6,330	12,600	9,650	3,530	960
...	225	320	302	1,500	1,920	2,600	10,400	7,460	11,500	8,900	3,380	932
...	255	320	302	1,400	1,800	2,930	8,900	7,920	9,400	8,400	3,460	866
...	255	255	388	1,200	1,730	3,180	7,230	8,650	7,460	8,400	3,460	822
...	255	255	376	1,080	1,650	3,240	7,000	9,150	7,000	7,920	3,240	812
...	255	248	407	1,020	1,620	3,460	6,550	8,900	6,550	7,460	3,180	795
...	195	265	382	894	1,540	3,530	8,650	8,160	7,230	6,770	3,310	752
...	195	300	370	756	1,540	3,530	8,160	8,160	7,360	6,550	3,110	746
...	195	388	428	735	1,620	3,760	7,230	8,650	7,460	6,550	2,820	715
...	195	502	428	2,300	1,620	3,760	7,230	9,400	7,920	6,330	2,650	690
...	170	486	421	2,650	1,620	3,680	7,920	9,910	9,400	6,330	2,500	655
...	195	526	334	2,440	1,620	3,600	8,900	9,650	9,650	6,330	2,350	680
...	195	502	421	2,870	1,620	3,920	8,650	11,000	10,400	6,110	2,220	655
...	170	340	418	2,400	1,650	4,520	7,920	10,400	11,500	6,330	2,170	655
...	170	295	418	8,900	1,840	4,800	7,920	11,200	13,200	6,330	2,130	636
...	170	349	370	2,760	2,440	4,890	8,650	11,500	11,500	6,110	1,960	768
...	195	219	373	1,800	3,680	4,800	9,400	11,500	12,100	5,690	1,800	960
...	195	290	404	1,620	9,910	4,980	9,150	11,200	11,200	5,180	1,580	812
...	170	270	367	3,380	5,690	5,280	7,460	10,400	11,500	4,700	1,440	746
...	170	456	650	5,080	4,080	5,480	6,110	11,000	11,500	4,260	1,370	710
...	170	410	474	6,110	3,310	5,280	5,280	9,910	10,400	4,340	1,300	680
...	170	478	559	16,700	2,930	4,890	4,890	8,650	8,650	4,340	1,300	650
...	170	506	660	24,700	2,760	4,610	4,800	7,920	7,690	4,340	1,240	1,540
...	170	506	550	8,900	2,540	4,260	4,520	8,900	8,400	4,170	1,200	2,130
...	170	474	510	5,480	2,500	3,680	4,340	11,000	9,400	4,340	1,170	1,500
...	170	518	538	4,080	.....	3,240	4,260	12,300	10,200	4,080	1,140	1,200
...	195	486	622	3,680	.....	3,050	4,080	14,100	11,000	3,600	1,080	1,080
...	460	.....	1,470	3,380	.....	2,930	.....	14,100	.....	3,380	1,050	.....

scharge determined from 2 well-defined rating curves applicable as follows: Oct. 1 to Nov. 8 aff gage at cable; Oct. 9 to Sept. 30 referred to gage 2 miles downstream.

scharge of San Joaquin River near Friant, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
.....	460	170	208	12,800	B.
.....	526	219	374	22,300	A.
.....	1,470	302	466	28,700	A.
.....	24,700	735	4,210	259,000	A.
.....	9,910	1,540	2,610	145,000	A.
.....	5,480	2,440	3,810	234,000	A.
.....	10,400	2,760	6,630	395,000	A.
.....	14,100	4,080	9,380	577,000	A.
.....	15,700	6,550	10,200	607,000	A.
.....	10,400	3,380	6,370	392,000	A.
.....	3,680	1,050	2,310	142,000	A.
.....	2,130	636	905	53,900	A.
ar.....	24,700	170	3,960	2,870,000	

SAN JOAQUIN RIVER NEAR NEWMAN, CAL.

—In the SW. ¼ sec. 3, T. 7 S., R. 9 E., at drawbridge on Hill's Ferry road, ɔt below mouth of Merced River and 3½ miles northeast of Newman.

AREA.—Not measured.

AVAILABLE.—April 29, 1912, to September 30, 1914.

ertical staff fastened to cribbing downstream from draw pier. Observer, us Lorensen.

E MEASUREMENTS.—Made from bridge or by wading.

AND CONTROL.—Sand; shifts during high water.

S OF DISCHARGE.—1912–1914: Maximum stage recorded, 18.0 feet January 14 (discharge, 20,700 second-feet); minimum stage recorded, 1.0 foot October 8 to 18, 1913 (discharge, 50 second-feet).

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STORAGE AND DIVERSIONS.—Water is stored and extensively used for power and irrigation on main river and tributaries above station. Record shows return water from irrigation and quantity available for use along the lower river.

ACCURACY.—Rating curves well defined; results good.

Discharge measurements of San Joaquin River near Newman, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Nov. 5	Lasley Lee	1.25	80	Mar. 30	Charles Leidl	10.12	6,170
Feb. 6	Charles Leidl	14.16	12,300	Aug. 25	do	3.65	626

Daily discharge, in second-feet, of San Joaquin River near Newman, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	66	66	292	920	18,000	12,200	5,250	5,870	15,600	13,200	2,780	450
2	60	66	318	5,620	17,100	10,700	4,770	5,130	16,000	13,200	2,620	420
3	60	66	346	3,580	15,800	9,530	4,330	4,770	16,000	13,200	2,460	395
4	55	72	346	3,220	14,600	8,150	4,330	5,010	15,200	12,800	2,220	395
5	50	72	360	3,580	13,400	7,040	4,440	5,740	14,800	12,600	2,070	395
6	55	79	374	3,400	12,400	6,390	6,130	6,520	14,800	12,400	2,000	370
7	55	86	360	3,040	11,300	6,130	6,650	7,040	14,000	12,100	1,860	370
8	50	86	332	2,680	10,000	6,000	6,650	7,860	13,600	11,700	1,860	345
9	50	86	318	2,070	8,600	6,000	7,040	8,750	13,400	11,300	1,790	320
10	50	86	318	1,750	7,300	6,000	7,580	9,370	13,400	11,200	1,720	320
11	50	79	318	1,630	6,520	6,000	8,750	8,900	14,000	11,000	1,720	320
12	50	72	318	1,460	5,740	6,260	9,210	8,900	14,600	10,700	1,720	320
13	50	93	318	1,400	5,250	6,520	9,210	9,370	15,200	10,500	1,580	295
14	50	116	305	1,340	4,890	6,520	9,050	10,200	15,400	10,300	1,580	295
15	50	116	318	3,130	4,550	6,520	9,370	11,000	15,600	10,200	1,450	295
16	50	116	346	3,400	4,330	6,520	9,690	11,300	15,400	10,000	1,390	275
17	50	125	332	3,400	4,110	6,520	9,690	11,300	15,200	9,530	1,270	275
18	50	134	318	6,910	4,220	9,520	9,370	11,500	15,200	9,050	1,210	275
19	55	164	318	13,200	4,890	6,520	9,210	11,900	15,200	8,450	1,090	255
20	55	154	318	13,400	5,250	6,520	9,690	12,100	14,600	7,860	980	255
21	55	164	332	11,900	8,300	6,520	10,300	12,400	14,200	7,170	930	245
22	60	174	346	10,700	14,000	6,780	10,000	12,400	13,800	6,780	880	235
23	55	185	374	12,800	13,800	7,040	9,370	12,400	13,200	6,130	780	235
24	55	196	575	14,400	13,000	7,040	8,900	12,600	12,800	5,490	730	235
25	60	218	650	14,800	12,800	7,040	8,750	12,400	12,600	4,890	650	235
26	60	242	650	17,300	13,200	7,040	8,450	12,100	12,400	4,330	570	235
27	60	266	825	20,700	13,600	6,910	8,450	11,900	12,100	3,900	540	235
28	60	266	735	19,700	13,200	6,780	8,450	12,400	12,200	3,500	540	226
29	60	279	610	19,400	.....	6,650	7,860	13,400	12,400	3,320	510	225
30	60	292	575	19,200	.....	6,260	7,040	14,400	12,800	3,140	480	215
31	60	.....	650	19,000	.....	5,870	.....	15,200	.....	2,960	480	.....

NOTE.—Discharge determined from 2 well-defined rating curves applicable Oct. 1 to Jan. 27 and Jan. 28 to Sept. 30.

Monthly discharge of San Joaquin River near Newman, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	66	50	55.0	3,380	B.
November	292	66	141	8,390	B.
December	825	292	416	25,600	B.
January	20,700	920	8,360	514,000	B.
February	18,000	4,110	10,000	555,000	B.
March	12,200	5,870	6,980	429,000	B.
April	10,300	4,330	7,930	472,000	B.
May	15,200	4,770	10,100	621,000	B.
June	16,000	12,100	14,200	845,000	B.
July	13,200	2,960	8,800	541,000	B.
August	2,780	480	1,370	8,420	B.
September	450	215	299	17,800	B.
The year	20,700	50	5,690	4,120,000	

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BIG CREEK NEAR SHAVER, CAL.

LOCATION.—In the NE. ¼ sec. 28, T. 8 S., R. 25 E., about one-fourth mile below Pitman Creek, 5½ miles above junction with San Joaquin River, and 5½ miles northeast of Shaver.

DRAINAGE AREA.—88 square miles (measured by Pacific Light & Power Corporation).

RECORDS AVAILABLE.—January 1, 1910, to September 30, 1914.

GAGE.—Hook gage at Huntington Lake; also a Storrow water-stage recorder at Dam No. 4.

DISCHARGE.—Computed from discharge of power house No. 1 plus flow over spillway at Huntington Lake. The discharge from power house No. 1 is taken from the kilowatt output of plant; flow over spillway is measured at a series of weirs on Dam No. 4.

EXTREMES OF DISCHARGE.—1910–1913: Maximum stage recorded June 21, 1911 (mean daily discharge, 10,800 second-feet); minimum stage recorded September 24 to 27, 1913 (mean daily discharge, 1 second-foot).

COOPERATION.—Estimates of daily discharge furnished by the Pacific Light & Power Corporation, through R. C. Starr, hydraulic engineer.

Daily discharge, in second-feet, of Big Creek near Shaver, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2	.....	.....	72	106	67	382	296	1,480	524	34	2.0
2	2	.....	.....	88	5.6	53	91	267	1,480	547	26	11
3	2	.....	.....	86	27	73	135	291	1,290	403	36	1.0
4	2	.....	.....	.....	38	58	117	381	1,350	440	18	2.5
5	2	.....	.....	116	35	54	189	540	1,060	356	31	2.0
6	2	.....	.....	.....	42	35	717	629	831	238	24	5.0
7	2	.....	12	2.8	22	10	646	812	582	304	35	21
8	2	.....	36	.....	24	50	321	660	807	162	1.0	.....
9	2	25	39	.....	30	100	571	1,020	938	196	7.5	4.0
10	2	37	39	.....	54	93	402	1,030	960	190	7.5	.....
11	2	61	79	50	21	93	475	1,100	673	234	16	19
12	2	36	24	86	34	98	266	1,120	380	90	18	25
13	2	50	34	61	23	100	460	1,100	1,700	112	26	21
14	2	33	.....	58	41	96	454	1,080	966	170	26	.....
15	2	20	38	62	44	93	465	1,440	916	139	22	21
16	2	12	.....	.....	47	147	461	1,520	986	156	18	.....
17	2	23	16	.....	90	128	532	1,190	1,110	124	16	23
18	2	28	52	109	23	183	586	1,290	1,200	120	8.5	7.5
19	2	45	145	35	108	212	605	546	1,050	82	21	22
20	2	27	61	20	78	157	514	2,100	1,150	114	2.0	12
21	2	22	.....	123	152	175	250	1,310	976	106	19	5.5
22	2	67	47	65	62	165	404	1,400	954	92	16	12
23	2	.....	.....	115	61	215	440	1,270	810	93	10	8.5
24	2	58	150	102	31	192	423	1,100	558	88	8.0	4.0
25	2	.....	87	168	16	188	346	1,080	758	100	27	51
26	2	25	45	189	63	186	325	944	626	21	15	41
27	2	39	31	120	27	161	338	883	862	64	18	32
28	2	40	.....	55	64	143	420	924	411	62	12	.....
29	2	32	74	110	.....	81	298	1,430	910	49	8.0	19
30	2	21	54	58	.....	120	298	1,270	533	52	5.5	9.0
31	2	.....	114	46	.....	110	.....	1,180	.....	42	3.0	.....

NOTE.—Discharge Feb. 15 estimated by engineers of U. S. Geological Survey.

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Monthly discharge of Big Creek near Shaver, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 88 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
October	2	2	2	0.023	0.03	123
February	152	5.6	48.9	.556	.58	2,720
March	215	10	117	1.33	1.53	7,190
April	717	91	398	4.52	5.04	23,700
May	2,100	267	1,010	11.5	13.26	62,100
June	1,700	380	944	10.7	11.94	56,200
July	547	21	176	2.00	2.31	10,800
August	36	1.0	17.3	.197	.23	1,060

NOTE.—Monthly discharge computed by engineers of U. S. Geological Survey.

PITMAN CREEK NEAR SHAVER, CAL.

LOCATION.—In the E. ½ sec. 28, T. 8 S., R. 25 E., just above junction with Big Creek, about 5½ miles northeast of Shaver.

DRAINAGE AREA.—25 square miles (measured by Pacific Light & Power Corporation.)

RECORDS AVAILABLE.—January 1, 1910, to September 30, 1914.

GAGE.—Hook gage on right bank in pool above weir.

DISCHARGE.—Computed from gage heights giving head on 38-foot masonry weir; crest of weir is a three-eighths inch angle bolted to the masonry. Formula used: $Q=3.66\ L\ (h-H)^{\frac{3}{2}}$.

EXTREMES OF DISCHARGE.—1910–1914: Maximum stage recorded, June 17, 1911 (mean discharge, 1,280 second-feet); minimum stage recorded, August 25 to 31, 1910, and September 29 to October 21, 25 to 29, and 31, 1913 (mean discharge, 0.1 second-foot).

ACCURACY.—Equipment installed carefully; results apparently good.

COOPERATION.—Estimates of daily discharge furnished by the Pacific Light & Power Corporation, through R. C. Starr, hydraulic engineer.

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r discharge, in second-feet, of Pitman Creek near Shaver, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July,	Aug.	Sept.
.....	0.1	0.2	1.0	3.0	1.0	3.0	14	50	350	40	2.0	1.0
.....	.1	.2	1.0	8.5	2.0	3.0	14	50	310	40	2.0	.5
.....	.1	.2	1.0	10	2.0	2.0	14	95	275	35	2.0	.5
.....	.1	.2	1.0	8.0	2.0	5.0	20	165	270	35	2.0	.5
.....	.1	.2	1.0	6.0	2.0	8.0	102	175	270	35	2.0	.5
.....	.1	.2	1.0	5.0	2.0	8.0	48	185	270	35	2.0	.5
.....	.1	.2	1.0	3.0	2.0	8.0	48	200	90	35	2.0	.5
.....	.1	.2	1.0	4.0	2.0	10	47	225	65	30	2.0	.5
.....	.1	.3	1.0	2.0	2.0	12	47	225	75	30	2.0	.5
.....	.1	.3	.7	1.0	2.0	12	45	160	160	30	2.0	.5
.....	.1	7.0	.7	1.0	2.0	14	45	180	160	25	2.0	5
.....	.1	2.6	.7	1.0	2.0	14	50	225	120	25	2.0	.5
.....	.1	2.8	1.0	2.0	2.0	14	48	250	125	18	2.0	.5
.....	.1	2.4	1.0	4.0	2.0	19	48	348	120	15	2.0	.5
.....	.1	1.9	1.0	5.0	2.0	19	60	360	120	15	1.0	.5
.....	.1	1.2	1.0	2.0	2.0	19	60	360	100	8.0	2.0	.5
.....	.1	1.9	.7	2.0	2.0	19	75	360	90	9.0	2.0	.5
.....	.1	2.9	.5	2.0	2.0	19	100	360	90	8.0	1.0	.5
.....	.1	2.9	.7	3.0	4.0	25	100	360	100	7.0	1.0	.5
.....	.1	2.9	.7	2.0	6.0	23	150	300	120	7.0	1.0	.5
.....	.1	2.9	1.0	1.0	6.0	23	140	275	100	6.0	1.0	.5
.....	.3	2.9	1.0	2.0	3.0	23	50	220	100	6.0	1.0	.5
.....	.4	2.9	1.0	2.0	4.0	19	25	220	100	5.0	1.0	.5
.....	.2	1.4	1.0	3.0	2.0	21	40	250	70	4.0	1.0	.5
.....	.1	1.4	1.0	6.0	2.0	23	40	135	70	3.0	1.0	.5
.....	.1	2.5	1.0	6.0	2.0	19	40	120	70	3.0	1.0	1.0
.....	.1	2.5	1.0	6.0	2.0	7.0	42	200	70	3.0	1.0	.5
.....	.1	1.4	1.5	2.0	3.0	7.0	42	290	65	3.0	1.0	1.0
.....	.1	1.4	1.0	1.0	.....	7.0	40	270	45	3.0	1.0	1.0
.....	.4	1.0	1.0	1.0	.....	8.5	60	320	40	2.0	1.0	1.0
.....	.1	.....	3.0	1.0	.....	14	.....	340	.....	2.0	1.0	.....

RE.—No record Nov. 1–8 and Jan. 17; discharge estimated by engineers of U. S. Geological Survey.

thly discharge of Pitman Creek near Shaver, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 27 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
er	0.4	0.1	0.13	0.005	0.01	8
nber	7.0	.....	1.70	.063	.07	101
nber	3.0	.5	1.01	.037	.04	62
ry	10	1.0	3.40	.126	.15	209
ary	6.0	1.0	2.46	.091	.09	137
l	25	2.0	13.8	.511	.59	848
.....	150	14	55.1	2.04	2.28	3,280
.....	360	50	235	8.70	10.03	14,400
.....	350	40	134	4.96	5.53	7,970
.....	40	2.0	16.8	.622	.72	1,030
st	2.0	1.0	1.52	.056	.06	93
mber	1.0	.5	.58	.022	.02	35
The year	360	0.1	38.9	1.44	19.59	28,200

RE.—Monthly and yearly discharge computed by engineers of U. S. Geological Survey.

CRANE VALLEY RESERVOIR NEAR NORTH FORK, CAL.

ane Valley reservoir was formed by constructing a dam on North Fork Creek in E. ½ sec. 26, T. 7 S., R. 22 E. The released water flows down the natural channel orth Fork Creek to a point just above the mouth of South Fork Creek, where it is ted into the *power canal.*

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Records beginning April, 1910, furnished by San Joaquin Light & Power Corporation. They show the total flow into the reservoir, including that of South Fork ditch,[1] which diverts water from South Fork Creek about one-fourth mile below the mouth of Browns Creek.

Maximum inflow recorded during year, 2,570 second-feet, January 25; minimum inflow October 2, 6, and 31, 2 second-feet.

Maximum inflow recorded 1910–1914, 2,750 second-feet, January 30, 1911; minimum inflow recorded, 2 second-feet October 2, 6, and 31, 1913.

Daily flow in second-feet, into Crane Valley reservoir near North Fork, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.8	5.5	6.5	471	120	130	76	113	179	34	8.3	5.0
2	2.0	8.3	5.5	251	105	130	104	123	149	36	36	5.1
3	3.7	8.5	3.3	155	92	130	113	121	144	35	26	6.0
4	2.6	5.5	4.6	102	86	125	295	156	140	34	28	7.1
5	2.9	5.7	4.5	73	86	140	319	162	110	32	32	7.6
6	2.0	9.8	6.2	65	87	150	180	166	80	31	19	8.0
7	3.3	7.6	6.6	66	86	135	165	167	126	32	28	8.4
8	6.5	6.5	6.6	65	66	156	150	160	97	32	10	8.0
9	3.6	6.0	6.8	38	76	150	284	150	85	26	10	8.1
10	4.1	4.0	6.0	47	72	144	252	140	98	24	11	6.3
11	5.1	9.0	7.7	37	71	157	202	145	91	28	5.8	3.6
12	4.2	18	5.6	57	71	158	165	150	96	25	8.1	3.6
13	4.9	24	14	387	79	160	169	150	88	17	9.5	3.7
14	4.5	15	10	199	65	172	194	150	73	18	8.0	3.5
15	6.4	5.1	10	218	66	165	214	145	98	21	12	7.1
16	5.6	7.6	9.5	140	72	167	189	140	81	20	9.4	3.6
17	5.2	5.9	8.0	554	62	168	131	134	84	15	8.0	3.1
18	4.5	24	6.0	452	168	162	196	138	91	17	7.5	55
19	6.9	16	10	154	215	165	204	145	88	16	7.0	12
20	6.2	20	7.6	107	732	188	178	145	83	15	6.4	11
21	5.7	10	10	102	774	180	166	140	71	14	6.0	9.0
22	4.8	10	81	640	272	175	145	130	66	14	6.6	4.0
23	4.2	7.5	32	244	192	170	134	145	61	14	5.8	3.3
24	4.2	6.5	38	526	196	165	134	145	52	14	6.7	42
25	4.7	7.3	81	2,570	154	160	141	135	45	12	6.2	16
26	5.0	6.8	41	948	158	175	136	135	42	8.5	5.0	3.0
27	6.0	20	24	302	140	123	138	145	46	9.7	6.3	3.0
28	7.2	12	26	208	125	137	116	151	52	9.2	7.7	3.1
29	2.3	13	30	184	.....	232	106	174	53	9.5	5.4	3.3
30	8.1	10	88	140	.....	151	110	171	46	9.0	5.8	3.1
31	2.0	.....	221	138	.....	108	.....	162	.....	11	5.6	.....

Monthly flow into Crane Valley reservoir near North Fork, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	8.1	2.0	4.55	280
November	24	4.0	10.5	625
December	221	3.3	26.4	1,620
January	2,570	37	311	19,100
February	774	62	160	8,870
March	232	108	156	9,590
April	319	76	170	10,100
May	174	113	146	8,980
June	179	42	87.2	5,190
July	36	8.5	20.4	1,250
August	36	5.0	11.5	707
September	55	5.1	11.4	678
The year	2,570	2.0	92.6	67,030

[1] Also known as Brown Creek ditch.

NOTE.—*Monthly* and yearly estimates computed by engineers of U. S. Geological Survey.

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EVAPORATION FROM CRANE VALLEY RESERVOIR NEAR NORTH FORK, CAL.

LOCATION.—In T. 7 S., R. 22 E., about 5 miles northwest of North Fork.

RECORDS AVAILABLE.—June 1, 1910, to September 30, 1914 (not complete).

METHOD.—Evaporation measured in a pan floating on the reservoir

ELEVATION.—About 3,350 feet above sea level.

MAXIMUM.—Greatest evaporation in one day during year, 0.03 foot, August 1 and 2. 1910–1914: Greatest evaporation in one day, 0.03 foot, June 24, 25, 1910, and August 1 and 2, 1914.

COOPERATION.—Data furnished by San Joaquin Light & Power Corporation.

Daily evaporation, in feet, from Crane Valley reservoir near North Fork, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	May.	June.	July.	Aug.	Sept.
1	0.015	.....	.....	0.02	0.01	0.03	0.01
2	.01	.....	.....	.025	.01	.03	.015
3	.01	.....	.....	.015	.01	.025	.01
4	.01	.....	.....	.02	.01	.025	.02
5	.01	0.005	.....	.02	.015	.02	.01
6	.015	.005	.....	.005	.015	.025	.005
7	.01	.005	.....	.00	.015	.02	.01
8	.00	.005	.....	.01	.015	.025	.01
9	.00	.01	.....	.015	.015	.025	.015
10	.01	.....	.....	.01	.02	.02	.015
11	.01	.....	.....	.015	.02	.025	.015
12	.015	.....	.....	.01	.02	.02	.015
13	.01	.....	.....	.01	.02	.025	.015
14	.01	.005	.....	.01	.02	.025	.015
15	.01	.....	.....	.02	.015	.025	.01
16	.01	.005	.....	.01	.015	.02	.015
17	.01	.....	0.005	.01	.015	.025	.01
18	.01	.....	.02	.005	.01	.02	.....
19	.01	.....	.02	.01	.015	.02	.01
20	.01	.....	.01	.02	.02	.02	.01
21	.01	.....	.005	.01	.02	.02	.015
22	.01	.....	.....	.01	.02	.02	.015
23	.01	.....	.....	.01	.02	.025	.015
24	.01	.....	.....	.01	.02	.025	.....
25	.01	.....	.....	.01	.025	.02	.01
26	.01	.....	.01	.015	.02	.02	.01
27	.015	.....	.....	.01	.025	.02	.01
28	.015	.....	.01	.01	.025	.025	.01
29	.01	.....	.01	.02	.02	.02	.01
30	.01	.....	.015	.015	.02	.015	.005
31	.01	.....	.015	.....	.02	.015	.....

SOUTH FORK CREEK[1] NEAR NORTH FORK, CAL.

LOCATION.—In the SE. ¼ sec. 19, T. 8 S., R. 23 E., at concrete weir just above mouth, about 5 miles east of North Fork.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—April 1, 1910, to September 30, 1914.

GAGE.—Watson water-stage recorder.

DISCHARGE.—Computed from gage-height record indicating head on 100-foot broad-crested concrete weir; weir rating checked by current-meter measurements.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year; January 25 (discharge, 3,000 second-feet); minimum stage recorded October 1 to 3 (discharge, 1.5 second-feet).

1910–1914: Maximum stage recorded, January 25, 1914 (discharge, 3,000 second-feet); minimum stage recorded June 30 to September 15, September 19 to October 11, and October 23 to November 11, 1910 (discharge, 1 second-foot).

[1] Known also as South Fork of Willow Creek.

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DIVERSIONS.—Below the mouth of Browns Creek, about 6 miles above the station, water is diverted from South Fork Creek into Crane Valley reservoir. This diversion is combined with the discharge at the gaging station to show total run-off from drainage basin.

COOPERATION.—Daily-discharge records furnished by San Joaquin Light & Power Corporation.

Daily discharge, in second-feet, of South Fork Creek near North Fork, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1.5	5.0	11	950	135	130	110	130	140	36	11	6.2
2	1.5	5.0	9.8	150	122	130	145	130	130	32	11	6.2
3	1.5	5.6	9.0	108	100	130	160	130	120	30	11	6.2
4	2.0	5.6	8.2	42	90	130	350	130	110	29	11	6.0
5	2.0	5.6	8.2	30	85	130	420	130	100	27	11	5.8
6	2.0	5.6	8.2	21	82	130	255	130	89	24	11	5.8
7	2.5	5.6	8.2	20	81	140	240	130	80	24	9.9	5.8
8	2.5	5.6	8.2	18	78	140	230	140	110	21	9.9	5.8
9	2.5	5.6	8.2	18	75	140	340	140	94	20	9.9	5.8
10	2.5	5.6	9.0	12	74	140	280	135	89	20	9.9	5.8
11	2.5	7.5	9.0	11	73	145	265	130	90	20	9.9	5.8
12	2.5	12	9.0	12	72	155	240	130	84	20	9.9	4.5
13	2.5	18	9.0	400	71	160	220	130	70	18	9.0	4.5
14	2.5	17	9.0	154	70	160	230	125	59	18	9.0	4.5
15	2.5	13	9.0	106	70	160	235	125	55	18	9.0	4.5
16	2.5	11	9.0	92	70	160	215	125	55	18	9.0	4.5
17	2.5	9.0	9.0	375	77	160	210	130	50	18	9.0	4.8
18	2.5	15	8.2	117	120	165	200	130	47	16	8.3	15
19	2.5	21	8.2	108	160	165	200	135	45	16	8.3	8.3
20	2.5	18	8.2	83	450	175	173	135	42	16	8.3	7.5
21	2.5	16	8.2	38	650	190	163	135	42	16	8.3	6.8
22	2.5	12	59	900	600	190	158	125	42	16	8.3	6.2
23	2.5	11	20	215	271	180	143	120	42	16	8.3	6.2
24	2.5	9.8	9.0	640	225	175	123	125	40	16	7.5	14
25	2.5	9.8	18	3,000	170	170	128	130	38	16	7.5	6.8
26	2.5	9.8	11	1,300	165	170	133	125	36	15	7.5	6.8
27	2.5	9.8	9.0	350	155	130	128	130	34	14	7.5	6.8
28	2.5	17	8.2	247	145	115	131	135	34	13	7.5	6.8
29	2.5	12	6.2	198	.....	225	125	135	34	12	7.5	6.8
30	2.5	12	18	165	.....	150	120	140	34	11	7.0	5.8
31	2.5	.....	95	155	.....	120	.....	145	.....	11	7.0	.....

NOTE.—Daily discharge Jan. 25, estimated by the San Joaquin Light & Power Corporation.

Monthly discharge of South Fork Creek near North Fork, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	2.5	1.5	2.35	144
November	21	5.0	10.5	625
December	95	6.2	14.1	867
January	3,000	11	324	19,919
February	650	70	162	9,000
March	225	115	154	9,470
April	420	110	202	12,020
May	145	120	131	8,055
June	140	34	67.8	4,034
July	36	11	19.3	1,187
August	11	7.0	9.01	554
September	15	4.0	6.35	378
The year	3,000	1.5	91.5	66,200

NOTE.—Monthly and yearly discharge computed by engineers of U. S. Geological Survey.

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WHISKEY CREEK NEAR NORTH FORK, CAL.

ON.—In the SE. ¼ sec. 16, T. 8 S., R. 23 E., just above highway bridge, about e-fourth mile below Cascadel ranch, and 6 miles east of North Fork.

AGE AREA.—Not measured.

DS AVAILABLE.—April 1, 1910, to September 30, 1914.

—Staff on left bank about 500 feet above bridge.

RGE MEASUREMENTS.—Made by wading near gage.

EL AND CONTROL.—Gravel.

MES OF DISCHARGE.—1910–1914: Maximum stage recorded January 25, 1914 (dis-arge, 1,000 second-feet); minimum stage recorded September 26, 1913 (discharge econd-foot).

ATION.—Daily-discharge records furnished by San Joaquin Light & Power rporation.

ischarge, in second-feet, of Whiskey Creek near North Fork, Cal., for the year ending Sept. 30, 1914.

y.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	1	1.5	6	375	60	55	45	42	42	9	5	2.5
.....	1	1.5	5	65	55	55	60	42	40	9	4.5	2.5
.....	1	1.5	5	45	45	55	65	42	39	9	4.5	2.5
.....	1	1.5	5	30	40	55	115	42	37	9	4	2.5
.....	1	1.5	5	20	35	55	165	42	34	9	4	2
.....	1	1.5	4.5	12	35	55	90	42	43	8	4	2
.....	1.5	1.5	4.5	12	35	55	90	45	36	8	4	2
.....	1.5	1.5	4.5	10	30	60	80	50	32	8	3.5	2
.....	1.5	1.5	4.5	10	30	60	80	50	30	7	3.5	2
.....	1.5	1.5	4.5	8	30	60	95	47	27	7	3.5	2
.....	1.5	3	5	6	30	60	90	42	27	7	3.5	2
.....	1.5	4.5	5	6	30	60	80	42	24	7	3.5	2
.....	1.5	7	5	150	30	65	75	42	21	7	3.5	1.5
.....	1.5	6	5	80	30	65	75	40	20	6	3.5	1.5
.....	1.5	5	5	40	30	65	75	40	30	6	3.5	1.5
.....	1.5	4	5	40	30	65	70	40	20	6	3.5	1.5
.....	1.5	4	5	120	35	65	70	44	19	6	3.5	1.5
.....	1.5	6	5	75	55	65	70	44	18	6	3.5	9
.....	1.5	10	5	35	75	65	70	44	18	6	3.5	3.5
.....	1.5	8	5	25	160	65	65	44	18	6	3	2
.....	1.5	6	5	20	220	75	65	44	17	6	3	2
.....	1.5	5	22	350	200	80	60	40	17	6	3	1.5
.....	1.5	4	10	80	110	80	55	35	16	5	3	1.5
.....	1.5	3.5	6	225	90	80	50.	35	15	5	3	7.5
.....	1.5	3.5	10	1,000	70	80	50	35	13	5	3	2.5
.....	1.5	3.5	6	450	70	75	45	35	12	5	3	2
.....	1.5	3.5	5.5	140	65	65	45	35	11	5	3	2
.....	1.5	8	5.5	100	60	50	45	40	11	5	3	1.5
.....	1.5	6	5	65	.....	70	45	40	10	5	2.5	1.5
.....	1.5	6	9	40	.....	60	45	40	10	5	2.5	1.5
.....	1.5	.....	56	35	.....	50	.....	42	.....	5	2.5	.....

—Discharge Jan. 25 estimated by San Joaquin Light & Power Corporation.

y discharge of Whiskey Creek near North Fork, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
.....	1.5	1	1.40	86
er.....	10	1.5	4.05	241
r.....	56	4.5	7.69	473
.....	1,000	6	118	7,260
.....	220	30	63.8	3,540
.....	80	50	63.5	3,900
.....	165	45	71.0	4,220
.....	50	35	41.5	2,550
.....	43	10	23.2	1,380
.....	9	5	6.5	400
.....	5	2.5	3.44	212
er.....	9	1.5	2.38	142
e year.....	1,000	1	33.8	24,400

—Monthly and yearly discharge computed by engineers of U. S. Geological Survey.

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FRESNO RIVER NEAR KNOWLES, CAL.

LOCATION.—In the N. ½ sec. 15, T. 8 S., R. 20 E., at Fresno Crossing, about 6 miles northeast of Knowles.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 16, 1911, to January 1, 1914, when station was discontinued.

GAGE.—Vertical staff fastened to alder tree on right bank, about 150 feet above highway bridge. Observer, J. E. Gayman.

DISCHARGE MEASUREMENTS.—Made from cable about 400 feet below gage or by wading.

CHANNEL AND CONTROL.—Small boulders, gravel, and sand; fairly permanent.

EXTREMES OF STAGE.—Maximum stage recorded during year, 3.2 feet January 1; minimum stage recorded, —0.15 foot October 1 (discharge, 1.2 second-feet; record for year incomplete).

1911–1914: Maximum stage recorded, 3.2 feet January 1, 1914; minimum stage recorded, —0.20 foot August 6 to 10, 1913 (discharge, 1 second-foot).

DIVERSIONS.—Water is diverted above the station for irrigation and lumbering purposes.

ACCURACY.—Rating curve well defined; results excellent for days on which gage was read.

Daily discharge, in second-feet, of Fresno River near Knowles, Cal., for the period Oct. 1 to Dec. 31, 1914.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	1.2			11				21			38
2				12				22			38
3	1.5			13				23			
4	1.5			14			6	24			38
5	2.0		6	15				25			57
6	4.0			16		15		26			
7	6.0			17		15	27	27			73
8	6.0			18				28		73	
9				19		32		29			
10				20		32		30			135
								31			135

MERCED RIVER AT YOSEMITE, CAL.

LOCATION.—At Sentinel Bridge at Yosemite, in Yosemite National Park, 1⅓ miles below mouth of Tenaya Creek and half a mile above mouth of Yosemite Creek.

DRAINAGE AREA.—236 square miles.

RECORDS AVAILABLE.—July, 1904, to June, 1909 (incomplete); January 4, 1912, to September,30, 1914.

GAGE.—Vertical staff on retaining wall on left bank 3 feet below the bridge. Observer, H. C. Currier.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Small boulders and gravel; shifts slightly during high water.

EXTREMES OF DISCHARGE.—1904–1909 and 1912–1914: Maximum stage recorded, 8.7 feet May 30, 1914 (discharge, 3,680 second-feet); minimum stage recorded, 2.25 feet November 1, 1913 (discharge, 14 second-feet).

WINTER FLOW.—Slightly affected by ice.

ACCURACY.—Rating curves are well defined and results are good.

COOPERATION.—Gage-height record furnished by officials of Yosemite National Park.

The following discharge measurement was made by H. J. Tompkins:

May 9, 1914: Gage height, 6.70 feet; discharge, 2,160 second-feet.

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Daily discharge, in second-feet, of Merced River at Yosemite, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	28	14	30	214	200	211	328	604	3,450	2,000	530	92
2	27	20	28	232	180	207	349	654	2,920	1,860	530	92
3	26	16	27	197	174	214	460	1,260	2,920	1,860	530	90
4	23	17	28	161	151	218	808	1,590	2,850	1,930	508	85
5	23	17	28	151	151	265	1,080	1,860	2,280	1,720	508	83
6	22	16	27	145	145	288	862	2,140	1,790	1,460	485	79
7	22	16	26	119	142	328	756	2,560	1,660	1,400	485	75
8	24	17	26	116	135	349	756	2,280	1,220	1,340	485	63
9	22	16	27	76	138	370	808	2,210	1,220	1,220	730	48
10	22	16	25	76	135	414	1,080	2,000	1,590	1,100	630	48
11	22	33	25	78	132	414	756	2,280	1,660	1,220	508	45
12	22	34	24	83	132	414	756	2,420	1,790	1,160	440	45
13	22	32	24	88	135	437	970	2,700	1,860	1,100	395	45
14	21	33	23	94	138	437	1,140	3,080	2,070	995	355	45
15	22	29	23	113	148	460	1,460	2,560	2,140	1,080	351	42
16	21	24	24	113	148	532	1,400	2,560	2,420	1,160	295	42
17	20	25	23	116	145	556	1,200	2,850	3,150	1,100	283	39
18	20	27	23	108	142	604	1,330	2,700	3,000	1,100	275	38
19	20	28	23	119	180	654	1,660	2,850	2,920	1,050	259	112
20	20	45	23	148	250	704	1,790	2,920	2,920	940	224	110
21	19	43	23	151	328	756	1,260	2,850	2,420	885	179	98
22	19	38	23	174	273	808	1,080	2,700	2,320	805	159	71
23	18	36	31	161	254	782	862	2,420	2,210	780	150	53
24	17	34	32	180	218	756	756	2,000	2,280	755	135	51
25	17	34	32	370	214	756	704	1,720	1,590	705	135	51
26	16	36	34	414	207	756	704	1,520	1,460	680	130	50
27	16	33	34	392	197	654	629	2,280	1,720	630	128	48
28	16	31	36	349	211	556	629	3,000	1,930	580	122	48
29	16	31	38	312	.....	508	604	3,150	1,960	555	112	71
30	16	30	38	250	.....	460	556	3,680	1,980	530	108	63
31	16	.....	132	214	.....	370	.....	3,300	.....	555	95	.....

NOTE.—Discharge determined from two rating curves well defined above 350 second-feet and fairly well defined below. No record, discharge interpolated, June 22, 29, and 30 and July 15. Discharge relation probably affected by ice during December.

Monthly discharge of Merced River at Yosemite, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 236 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	28	16	20.5	0.087	0.10	1,260	B.
November	45	14	27.4	.116	.13	1,630	B.
December	132	23	31.0	.131	.15	1,910	B.
January	414	76	178	.754	.87	10,900	B.
February	328	132	179	.758	.79	9,940	B.
March	808	207	492	2.08	2.40	30,300	A.
April	1,790	328	918	3.89	4.34	54,600	A.
May	3,680	604	2,350	9.96	11.48	144,000	A.
June	3,450	1,220	2,190	9.28	10.35	130,000	A.
July	2,000	530	1,100	4.66	5.37	67,600	A.
August	730	95	331	1.40	1.61	20,400	A.
September	112	38	64.1	.272	.30	3,810	B.
The year	3,680	14	659	2.79	37.89	476,000	

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MERCED RIVER NEAR MERCED FALLS, CAL.

LOCATION.—In the NW. ¼ sec. 11, T. 5 S., R. 15 E., near mouth of canyon, about 2 miles above dam at Merced Falls.

DRAINAGE AREA.—1,090 square miles.

RECORDS AVAILABLE.—April 6, 1901, to November 30, 1913.

GAGE.—Staff in five sections on right bank. Observer, C. Kelsey.

DISCHARGE MEASUREMENTS.—Made from cable at gage or by wading.

CHANNEL AND CONTROL.—Gravel; shifts during high water.

EXTREMES OF DISCHARGE.—1901–1913.—Maximum stage recorded, 21.05 feet January 30, 1911 (discharge, 37,200 second-feet); channel dry November 21, 1901.

REGULATION.—Flow somewhat affected by power development several miles above the station.

ACCURACY.—Rating curve well defined; results good.

Discharge measurements of Merced River, near Merced Falls, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Oct. 21	H. J. Tompkins	7.93	57
Feb. 6	Lasley Lee	10.17	1,000

Daily discharge, in second-feet, of Merced River near Merced Falls, Cal., for the period Oct. 1 to Nov. 30, 1913.

Day.	Oct.	Nov.	Day.	Oct.	Nov.	Day.	Oct.	Nov.
1	44	52	11	44	70	21	44	166
2	70	24	12	52	70	22	52	178
3	44	11	13	70	61	23	61	143
4	110	24	14	44	143	24	52	143
5	52	61	15	30	132	25	44	121
6	110	61	16	8	132	26	52	89
7	61	70	17	24	100	27	36	132
8	52	80	18	30	100	28	61	166
9	36	61	19	36	143	29	52	154
10	36	61	20	52	204	30	10	154
						31	61	.....

NOTE.—Discharge determined from a well defined rating curve.

Monthly discharge of Merced River near Merced Falls, Cal., for the period Oct. 1 to Nov. 30, 1913.

[Drainage area, 1,090 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	110	8	49.4	0.045	0.05	3,040	B.
November	204	11	103	.094	.10	6,130	B.

TENAYA CREEK NEAR YOSEMITE, CAL.

LOCATION.—At Tenaya Bridge, in Yosemite National Park, 1¼ miles east of Yosemite, five-eighths mile below outlet of Mirror Lake, and five-eighths mile above junction with Merced River.

DRAINAGE AREA.—47 square miles.

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RECORDS AVAILABLE.—July, 1904, to June, 1909 (incomplete); January 5, 1912, to September 30, 1914.

GAGE.—Vertical staff fastened to left abutment of bridge near upstream end. This gage was removed about December 1, 1912, when bridge was repaired. New vertical staff was fastened to left abutment near downstream end on February 4, 1913. Original datum was not maintained, as bench mark was destroyed. Observer, H. C. Currier.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Small boulders and gravel; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, May 14 (discharge estimated, 1,010 second-feet); minimum stage recorded, 1.28 feet September 12 to 30 (discharge, 3.2 second-feet).

1904–1909 and 1912–1914: Maximum stage recorded, June 16, 1906 (discharge, 1,280 second-feet); minimum stage recorded, 2.9 feet during most of October, 1906 (discharge, 0.5 second-foot).

WINTER FLOW.—Probably somewhat affected by ice.

ACCURACY.—Rating curves are fairly well defined; results excellent.

COOPERATION.—Gage-height record furnished by officials of Yosemite National Park.

Discharge measurements of Tenaya Creek near Yosemite, Cal., during the year ending Sept. 30, 1914.

[Made by H. J. Tompkins.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
May 10	4.21	497
14	4.70	652

Daily discharge, in second-feet, of Tenaya Creek near Yosemite, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	5.0	4.7	11	110	55	55	315	151	895	390	45	5.0
2	5.0	4.7	11	131	48	55	272	173	775	360	38	4.5
3	5.0	6.5	11	74	48	55	115	360	695	345	34	4.5
4	5.0	6.5	11	66	44	56	131	435	660	360	25	4.0
5	4.7	5.0	11	55	42	64	286	485	590	360	22	4.0
6	4.7	5.0	11	48	42	74	246	555	572	345	22	3.5
7	4.7	4.7	11	38	38	80	221	590	555	300	22	3.5
8	4.7	4.7	11	38	38	85	221	625	485	286	21	3.5
9	4.7	4.7	10	32	34	90	272	625	360	221	20	3.5
10	4.7	4.7	10	31	34	95	272	485	345	221	20	3.5
11	4.7	4.7	10	31	34	101	209	805	390	197	20	3.5
12	4.7	4.7	10	29	34	107	221	805	450	131	18	3.2
13	4.7	4.7	10	30	31	113	246	891	485	131	16	3.2
14	4.7	4.7	10	31	31	113	345	1,010	555	141	13	3.2
15	4.7	4.7	8.8	38	34	113	405	920	590	131	14	3.2
16	4.7	4.7	8.8	44	34	131	272	611	660	122	13	3.2
17	4.7	6.5	8.8	42	32	147	286	863	775	113	12	3.2
18	4.7	6.5	8.8	38	32	173	300	834	815	122	12	3.2
19	4.7	13	8.0	31	46	185	315	949	735	131	12	3.2
20	4.7	13	8.0	31	74	197	420	695	695	162	11	3.2
21	4.7	13	8.0	34	98	221	375	695	590	131	11	3.2
22	4.7	13	8.0	47	86	234	272	735	572	113	10	3.2
23	4.7	12	8.8	46	69	246	259	520	520	98	8	3.2
24	4.7	12	8.8	57	64	259	197	485	502	92	7.1	3.2
25	4.7	12	8.8	197	60	272	173	420	450	74	6.5	3.2
26	4.7	12	10	185	60	286	173	390	390	80	6.5	3.2
27	4.7	12	10	131	58	300	151	572	375	64	6.0	3.2
28	4.7	12	14	110	55	246	173	695	390	55	6.0	3.2
29	4.7	12	16	85	.....	173	162	775	420	50	5.5	3.2
30	4.7	12	19	64	.....	141	131	815	420	46	5.5	3.2
31	4.7	.....	85	55	.....	113	.....	935	.....	38	5.0	.....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge May 11–19, 1914, estimated by comparison with record of daily discharge of Yosemite Creek at Yosemite, Cal.; discharge Aug. 26 to Sept. 7, Sept. 14 and 16 interpolated.

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Monthly discharge of Tenaya Creek near Yosemite, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 47 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	5	4.7	4.74	0.101	0.12	291	B.
November	13	4.7	8.01	.170	.19	477	B.
December	85	8	12.8	.272	.31	787	A.
January	197	29	63.8	1.36	1.57	3,920	A.
February	98	31	48.4	1.03	1.07	2,690	A.
March	300	55	148	3.15	3.63	9,100	A.
April	420	115	248	5.28	5.89	14,800	A.
May	[a] 1,010	151	642	13.7	15.79	39,500	B.
June	895	345	557	11.9	13.28	33,100	A.
July	390	38	175	3.72	4.29	10,800	A.
August	45	5	15.7	.334	.39	965	B.
September	5	3.2	3.46	.074	.08	206	B.
The year	[a] 1,010	3.2	161	3.43	46.61	117,000	

[a] Estimated.

YOSEMITE CREEK AT YOSEMITE, CAL.

LOCATION.—At highway bridge in Yosemite National Park, half a mile above junction with Merced River, and one-fourth mile northwest of Yosemite.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—July, 1904, to June, 1909 (incomplete); January 4, 1912, to September 30, 1914.

GAGE.—Vertical staff fastened to a cottonwood tree on right bank 25 feet above bridge, installed January 4, 1912. Original gage, at approximately same datum, was a vertical staff fastened to an alder tree on right bank 50 feet above bridge. On February 5, 1913, a new staff in two sections was installed on left bank at bridge; datum of this gage is 3.04 feet above that of previous gages. Observer, H. C. Currier.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Fine gravel and sand; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 7.3 feet May 14 (discharge, 875 second-feet); minimum stage recorded, 2.68 feet October 1, 27, and 29 (discharge, 0.4 second-feet).

1912-1914: Maximum stage recorded, 7.3 feet May 14, 1914 (discharge, 875 second-feet); minimum stage recorded, 2.56 feet October 7 to 27, 1912 (discharge, 0.1 second-foot).

WINTER FLOW.—Discharge relation somewhat affected by ice.

ACCURACY.—Rating curve fairly well defined; results good.

COOPERATION.—Gage-height record furnished by officials of Yosemite National Park.

Discharge measurements of Yosemite Creek at Yosemite, Cal., during the year ending Sept. 30, 1914.

[Made by H. J. Tompkins.]

Date.	Gage height.	Discharge.
	Feet.	*Sec-ft.*
May 10	5.35	418
14	6.48	644

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Daily discharge, in second-feet, of Yosemite Creek at Yosemite, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.4	0.5	1.8	54	22	43	110	184	850	220	21	1.2
2	.5	.5	2.1	43	14	50	107	202	627	220	21	1.4
3	.7	.5	3.9	28	28	28	149	555	750	240	19	1.4
4	1.3	.5	3.6	20	13	56	281	579	651	193	20	1.3
5	1.3	.5	4.2	15	15	69	414	627	414	149	19	1.3
6	1.2	.6	2.7	17	8.6	80	303	483	303	132	18	1.3
7	1.4	.5	3.3	15	9.0	91	240	700	270	132	18	1.2
8	1.1	.5	2.4	14	9.6	99	202	825	220	115	17	1.2
9	1.1	.5	3.6	3.0	9.0	97	202	750	240	112	17	1.2
10	1.1	.5	3.0	3.6	13	96	260	414	270	102	16	1.2
11	1.1	.7	2.7	4.2	15	125	184	700	281	97	15	1.2
12	.9	1.0	3.3	7.2	14	124	184	700	325	93	15	1.2
13	1.0	.9	3.9	12	17	125	347	775	437	107	13	1.2
14	.9	1.1	4.5	9.0	19	118	281	875	391	76	10	1.2
15	.8	1.3	7.2	13	32	115	270	800	391	91	8.1	1.1
16	.8	1.3	3.9	9.0	4.5	121	260	531	460	85	8.6	1.1
17	.6	1.5	6.3	8.6	7.2	127	240	750	850	76	7.2	1.1
18	.7	1.4	4.5	7.2	8.1	149	460	725	675	72	5.8	1.1
19	.6	1.5	4.2	7.6	8.6	175	483	825	531	61	5.0	1.5
20	.5	1.4	4.2	9.0	9.0	184	369	603	507	54	3.9	1.8
21	.5	1.4	5.0	11	38	202	281	627	483	49	3.3	1.5
22	.5	2.1	5.8	17	36	211	220	579	483	47	3.0	1.4
23	.5	3.6	5.0	14	31	202	175	555	460	44	2.4	1.1
24	.6	3.0	4.5	21	27	202	158	414	437	39	1.5	1.0
25	.5	2.1	6.3	76	28	202	158	347	314	32	1.4	1.0
26	.5	1.8	8.1	107	30	149	149	303	240	29	1.3	1.0
27	.4	2.4	5.4	86	32	132	132	460	303	28	1.3	1.0
28	.5	3.0	5.8	55	39	115	130	579	281	28	1.2	1.0
29	.4	3.3	6.3	55	.....	91	124	700	210	26	1.0	1.1
30	.5	3.6	6.3	44	.....	115	132	750	230	24	1.0	1.1
31	.6	.....	24	26	.....	112	.....	725	.....	23	1.2	.....

NOTE.—Discharge determined from a well defined rating curve. Discharge Mar. 16 and 31 and Apr. 1, 1914, interpolated; backwater, due to a snow jam, existed Mar. 31 and Apr. 1.

Monthly discharge of Yosemite Creek at Yosemite, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1.4	0.4	0.76	47	C.
November	3.6	.5	1.45	86	C.
December	24	1.8	5.09	313	B.
January	107	3.0	26.2	1,610	B.
February	39	4.5	19.2	1,070	B.
March	211	28	123	7,560	B.
April	483	107	234	13,900	B.
May	875	184	601	37,000	C.
June	850	220	430	25,600	B.
July	240	23	90.2	5,550	B.
August	21	1.0	9.55	587	B.
September	1.8	1.0	1.21	72	C.
The year	875	.4	129	93,400	

SOUTH FORK OF MERCED RIVER NEAR WAWONA, CAL.

LOCATION.—In the SE. ¼ sec. 33, T. 4 S., R. 21 E., in Sierra National Forest and 1 mile northwest of Wawona. Big Creek enters half a mile above and Rush Creek three-fourths of a mile below the station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—December 15, 1910, to September 30, 1914.

GAGE.—Vertical staff installed August 22, 1911, on alder tree on left bank, 250 feet below site of original gage, which was a vertical staff fastened to the center pier of the footbridge that was destroyed by high water January 30, 1911; original datum not maintained.

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DISCHARGE MEASUREMENTS.—Made from cable at gage or by wading.

CHANNEL AND CONTROL.—Gravel and boulders; appears permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 7.2 feet January 26 and February 19 and 20 (discharge, 3,770 second-feet); minimum stage recorded, 2.0 feet October 1 to November 5 and November 7 to 10 (discharge, 14 second-feet).

1910–1914: Maximum stage recorded, 7.2 feet January 26 and February 19 and 20, 1914 (discharge, 3,770 second-feet); minimum stage recorded, 1.8 feet October 14, 19, 20, 22, and 23, 1912 (discharge, 8 second-feet; a miscellaneous measurement made September 24, 1910, gave discharge, 2.6 second-feet).

DIVERSIONS.—The ranch of the Wawona Co. is irrigated from a tributary above the station.

ACCURACY.—Rating curve well defined below 2,200 second-feet; results good.

COOPERATION.—Maintained in cooperation with United States Forest Service. Gage height record furnished by A. C. Leonard, ranger in Yosemite National Park.

Discharge measurements of South Fork of Merced River near Wawona, Cal., during the year ending Sept. 30, 1914.

[Made by H. J. Tompkins.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
May 12	4.70	1,270
12	5.08	1,630

Daily discharge, in second-feet, of South Fork of Merced River near Wawona, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	14	14	42	110	450	450	895	1,200	2,300	625	75
2	14	14	42	140	395	395	825	1,120	2,500	625	77
3	14	14	42	505	395	395	895	1,200	2,700	565	70
4	14	14	36	505	345	450	970	1,280	2,700	478	73
5	14	14	36	110	345	450	1,120	1,280	2,600	450	69
6	14	26	42	110	345	450	1,040	1,540	2,700	422	65
7	14	14	42	110	295	505	970	1,720	2,600	365	65
8	14	14	42	110	250	505	970	1,360	2,600	360	59
9	14	14	42	110	210	505	825	1,360	2,700	320	59
10	14	14	42	110	210	505	755	1,280	2,700	286	60
11	14	26	42	140	210	505	755	1,360	2,600	272	71
12	14	26	42	140	140	505	895	1,450	2,600	250	59
13	14	26	36	140	140	505	895	1,580	2,700	234	53
14	14	26	36	250	140	505	895	1,720	2,700	218	45
15	14	26	36	295	110	505	970	1,810	2,800	218	41
16	14	26	36	295	110	565	970	1,810	2,700	222	39
17	14	26	36	395	140	565	895	1,810	2,700	210	36
18	14	26	36	450	295	565	895	1,900	2,700	218	36
19	14	36	49	505	3,770	565	970	1,900	2,800	203	32
20	14	36	49	755	3,770	625	970	2,000	2,700	182	30
21	14	36	49	825	3,550	625	1,040	2,100	2,800	172	28
22	14	36	65	755	1,120	625	1,040	2,100	2,800	140	25
23	14	26	65	565	1,040	625	1,040	2,100	2,700	134	25
24	14	26	65	825	1,120	625	970	2,200	2,600	131	23
25	14	26	65	1,280	755	690	970	2,300	2,600	125	22
26	14	36	65	3,770	450	825	1,040	2,300	2,600	128	22
27	14	36	65	1,620	450	895	1,040	2,200	2,600	122	21
28	14	36	85	895	450	970	1,040	2,200	1,810	105	21
29	14	42	85	825	.....	970	1,040	2,300	1,620	100	20
30	14	36	110	755	.....	1,040	1,120	2,300	1,200	85	20
31	14	.....	110	755	.....	1,040	.....	2,300	.....	81	20

NOTE.—Discharge determined from a well-defined rating curve. No record, discharge interpolated, Mar. 21, May 11 and 13, and June 25. Discharge for September, 1914, estimated from observer's note at 20 second-feet.

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Monthly discharge of South Fork of Merced River near Wawona, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	14	14	14.0	861	C.
November	42	14	25.6	1,520	B.
December	110	36	52.7	3,240	B.
January	3,770	110	586	36,000	B.
February	3,770	110	750	41,700	B.
March	1,040	395	611	37,600	A.
April	1,120	755	957	56,900	A.
May	2,300	1,120	1,780	109,000	A.
June	2,800	1,200	2,550	152,000	A.
July	625	81	260	16,000	B.
August	79	20	44.4	2,730	B.
September	.....	.....	[a] 20	1,190	C.
The year	3,770	14	633	459,000	

[a] Estimated.

TUOLUMNE RIVER AT HETCH HETCHY CABIN, NEAR SEQUOIA, CAL.

LOCATION.—Near east line of sec. 10, T. 1 N., R. 20 E., in Hetch Hetchy Valley, in Yosemite National Park, about half a mile above mouth of Falls Creek, 2 miles above Hetch Hetchy dam site, and about 13 miles northeast of Sequoia.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 1, 1910, to September 30, 1914.

GAGE.—Staff on left bank at Hetch Hetchy cabin. Lietz water-stage recorder, 25 feet above staff gage.

DISCHARGE MEASUREMENTS.—Made from cable 50 feet above staff gage or by wading.

CHANNEL AND CONTROL.—Gravel; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year, from water-stage recorder, 12.4 feet June 11 (discharge, 6,990 second-feet); minimum stage from water-stage recorder, 0.05 foot October 28 to 31 (discharge, 24 second-feet).

1910–14: Maximum stage recorded, 14.52 feet June 18, 1911 (discharge, 9,250 second-feet); minimum stage recorded, 0.60 foot December 24 and 25, 1911 (discharge, 14 second-feet).

WINTER FLOW.—Stage-discharge relation slightly affected by ice.

ACCURACY.—The rating curve well defined; results excellent.

COOPERATION.—Complete records to April, 1914, furnished by city of San Francisco. Beginning May 1, 1914, station has been maintained by the United States Geological Survey in cooperation with the city of San Francisco, through M. M. O'Shaughnessy, city engineer.

Discharge measurements of Tuolumne River at Hetch Hetchy cabin, near Sequoia, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 8	Lasley Lee	7.32	3,360	July 29	Lasley Lee	3.80	1,140
16	.....do	8.68	4,270	30	.....do	3.63	1,050
24	W. V. Hardy	6.75	2,950	Aug. 1	.....do	3.43	950
26	.....do	5.60	2,220	9	R. C. Rice	3.08	827
28	.....do	9.50	4,760	13	Lasley Lee	2.75	664
29	.....do	10.92	5,800	18	.....do	2.19	470
30	.....do	12.22	6,860	20	W. V. Hardy	1.64	282
June 1	.....do	13.20	7,720	28	.....do	1.12	166
9	.....do	5.02	1,930	Sept. 3	.....do	.90	129
July 25	Lasley Lee	4.59	1,600	11	Lasley Lee	.51	76
25	R. C. Rice	4.17	1,400				

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Daily discharge, in second-feet, of Tuolumne River at Hetch Hetchy cabin, near Sequoia, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	60	32	59	1,680	490	548	512	933	6,990	4,470	933	135
2	55	34	73	625	420	480	500	1,200	6,140	4,540	983	136
3	53	40	66	550	395	450	750	1,800	5,840	4,540	1,010	136
4	50	45	102	375	360	485	990	2,400	5,620	4,190	983	128
5	48	39	77	350	337	610	2,090	2,800	4,330	3,700	933	120
6	48	53	82	325	305	700	1,500	2,990	2,860	3,580	958	108
7	44	45	59	310	295	725	1,320	3,210	2,280	3,250	958	100
8	44	45	77	365	298	810	1,260	3,420	1,920	3,120	791	94
9	45	40	87	276	280	840	1,080	3,640	1,980	2,800	791	87
10	48	36	66	220	295	830	2,020	2,920	2,340	2,470	768	83
11	45	51	57	220	339	845	1,240	3,150	2,920	2,600	682	77
12	40	77	66	212	337	853	1,120	3,370	3,510	2,620	640	71
13	37	62	49	303	325	948	1,290	3,600	3,380	2,530	620	70
14	37	74	61	305	335	915	1,730	3,820	4,330	2,560	581	69
15	34	64	57	337	353	915	2,080	4,050	5,100	2,550	558	66
16	32	59	51	333	330	988	1,820	4,120	5,240	2,600	535	61
17	32	54	58	335	318	1,040	1,560	4,190	6,750	2,660	506	61
18	32	52	49	650	350	1,070	1,720	4,680	6,990	2,400	444	59
19	32	77	46	377	480	1,060	2,260	4,120	6,750	2,280	328	104
20	30	115	51	345	725	1,050	2,400	3,930	6,300	2,160	292	132
21	29	98	52	330	1,160	1,230	1,930	3,740	5,860	1,920	251	105
22	29	67	120	1,350	680	1,340	1,560	3,560	5,410	1,740	222	87
23	29	70	66	625	550	1,440	1,290	3,370	4,960	1,620	211	78
24	27	70	82	784	475	1,260	1,100	3,180	4,540	1,570	207	73
25	26	72	109	1,860	468	1,120	1,050	2,540	3,510	1,510	198	75
26	26	74	104	1,720	430	1,020	1,090	2,340	2,920	1,510	184	107
27	25	77	90	938	415	840	995	3,380	3,440	1,390	175	112
28	24	82	112	665	464	720	940	4,680	4,050	1,360	162	94
29	24	87	115	570	.....	665	880	5,470	4,750	1,220	154	82
30	24	84	220	515	.....	585	850	6,300	4,260	1,110	144	74
31	24	.....	495	495	.....	548	.....	6,370	.....	1,030	135	.....

NOTE.—Discharge Oct. 1, 1913, to Apr. 30, 1914, furnished by city of San Francisco. Discharge for May 1 to Sept. 30, 1914, determined from a well-defined rating curve. Discharge interpolated or estimated by comparison with records of station at Hetch Hetchy dam site for May 7, 8, 11–14, 20–23; June 20–22, and July 12–15.

Monthly discharge of Tuolumne River at Hetch Hetchy cabin, near Sequoia, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	60	24	36.5	2,240	
November	115	32	62.5	3,720	
December	495	46	92.2	5,670	
January	1,860	212	592	36,400	
February	1,160	280	429	23,800	
March	1,440	450	869	53,400	
April	2,400	500	1,360	80,900	
May	6,370	933	3,520	216,000	B.
June	6,990	1,920	4,510	268,000	A.
July	4,540	1,030	2,500	154,000	A.
August	1,010	135	527	32,400	A.
September	136	59	92.8	5,520	A.
The year	6,990	24	1,220	882,000	

TUOLUMNE RIVER AT HETCH HETCHY DAM SITE, NEAR SEQUOIA, CAL.

LOCATION.—In the NW. ¼ sec. 16, T. 1 N., R. 20 E., at Hetch Hetchy dam site in Yosemite National Park, about 1½ miles below mouth of Falls Creek, and about 11 miles northeast of Sequoia.

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DRAINAGE AREA.—459 square miles.[1]

RECORDS AVAILABLE.—December 1, 1910 to September 30, 1914 (not complete).

GAGE.—Lietz water-stage recorder and vertical staff on left bank at dam site.

DISCHARGE MEASUREMENTS.—Made from cable 50 feet above gage or by wading.

CHANNEL AND CONTROL.—Sand and fine gravel; somewhat shifting.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder 23.2 feet June 17 (discharge, 7,970 second-feet); minimum stage from water-stage recorder, 1.07 feet October 28 to 31 (discharge, 24 second-feet).

1911–1914: Maximum stage recorded, 24.8 feet June 18, 1911 (discharge, 11,400 second-feet); minimum stage recorded, December 24 and 25, 1911 (discharge, 17 second-feet).

WINTER FLOW.—Stage-discharge relation slightly affected by ice.

ACCURACY.—Rating curve well defined; results excellent for periods when recording gage was in operation. Discharge for days for which gage heights were missing estimated by comparison with record at Hetch Hetchy cabin.

COOPERATION.—Complete records to April 30, 1914, furnished by city of San Francisco; since May 1, 1914, station maintained by the United States Geological Survey in cooperation with the city of San Francisco through M. M. O'Shaughnessy, city engineer.

Discharge measurements of Tuolumne River at Hetch Hetchy dam site, near Sequoia, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 16	Lasley Lee	18.52	5,040	July 29	Lasley Lee	8.46	1,500
16	....do	17.62	4,670	Aug. 1	....do	7.00	1,130
24	W. V. Hardy	16.40	4,030	13	....do	5.20	753
26	....do	13.42	2,190	17	....do	4.42	621
28	....do	19.36	5,500	20	W. V. Hardy	2.48	346
29	....do	21.00	6,450	23	....do	1.52	246
30	....do	22.55	7,540	27	....do	1.14	204
June 9	....do	11.38	2,180	Sept. 3	....do	.53	149
July 24	Lasley Lee	10.40	2,020	11	Lasley Lee	−.31	82
25	....do	9.62	1,750	16	....do	−.45	70

[1] Freeman, J. R., The Hetch Hetchy water supply for San Francisco, 1912, p. 24.

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Daily discharge, in second-feet, of Tuolumne River at Hetch Hetchy dam site, near Sequoia, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	58	29	80	1,200	535	595	560	a1,130	a7,900	5,380	1,110	a 145
2	51	34	93	700	454	504	550	a1,500	7,060	a5,460	1,130	142
3	50	35	89	665	404	455	820	2,230	a6,780	a5,480	1,170	a 142
4	48	44	100	380	365	550	1,100	3,000	a6,580	a5,140	1,110	a 133
5	47	40	110	447	347	689	2,620	a3,400	a5,310	4,660	a1,080	a 125
6	47	44	104	370	331	820	1,800	a3,590	a3,860	4,520	a1,120	a 112
7	45	44	80	370	320	855	1,520	a3,930	a3,300	4,120	1,130	a 104
8	45	44	97	400	325	935	1,400	a4,270	a2,960	3,940	998	a 98
9	47	42	110	320	294	975	1,220	4,610	a3,040	3,530	915	a 90
10	48	38	84	294	304	960	3,070	a3,890	a3,420	3,110	895	86
11	47	48	74	280	337	995	1,400	a4,110	a4,030	3,250	a 803	80
12	44	93	74	258	336	1,070	1,280	a4,330	a4,640	3,250	a 755	76
13	39	75	65	447	330	1,060	1,420	a4,550	a4,530	3,140	a 729	a 76
14	37	89	82	350	337	1,040	1,990	a4,770	a5,500	3,140	684	a 77
15	34	74	73	432	343	1,040	2,560	a4,990	6,290	3,110	633	a 76
16	34	61	71	428	331	1,140	2,200	5,060	7,820	3,140	617	72
17	34	57	71	447	334	1,220	1,830	5,160	7,970	3,250	585	72
18	34	58	71	535	378	1,280	1,990	5,760	7,540	3,000	523	72
19	34	93	62	445	521	1,300	2,880	5.700	a7,300	2,760	424	116
20	31	130	68	432	1,420	1,310	3,200	a5,360	a6,740	2,560	350	a144
21	29	125	68	400	1,220	1,520	2,320	a5,030	a6,180	2,320	295	a 117
22	29	88	120	1,300	800	1,620	1,780	a4,690	a5,620	2,050	262	a 100
23	29	88	91	654	609	1,680	1,420	a4,360	5,060	1,910	242	91
24	27	82	115	922	503	1,400	1,220	4,020	a4,800	1,880	237	87
25	26	88	145	2,820	478	1,280	1,160	3,110	a4,170	1,810	a 227	88
26	26	88	144	1,850	446	1,160	1,170	4,380	3,810	1,760	a 212	118
27	25	97	135	1,450	419	977	1,060	5,760	4,430	1,660	202	a 124
28	24	103	155	1,040	482	847	1,040	6,540	5,060	1,610	a 186	a 108
29	24	110	155	750	.....	750	980	7,260	5,600	1,460	a 174	a 97
30	24	115	228	600	.....	675	950	7,190	5,650	1,310	a 160	a 91
31	24	.....	660	555	.....	623	.....	a7,270	.....	1,200	a 148	.....

a Estimated by comparison with the flow at Hetch Hetchy cabin station and inflow between the cabin and dam site stations.

NOTE.—Record of daily discharge prior to May 1 furnished by city of San Francisco; May 1 to Sept. 30, discharge determined from a well-defined rating curve.

Monthly discharge of Tuolumne River at Hetch Hetchy dam site, near Sequoia, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	58	24	36.8	2,260	
November	130	29	71.9	4,280	
December	660	62	119	7,320	
January	2,820	258	695	42,700	
February	1,420	294	475	26,400	
March	1,680	455	1,010	62,100	
April	3,200	550	1,620	96,400	
May	7,270	1,130	4,550	280,000	B.
June	7,970	2,960	5,430	323,000	B.
July	5,480	1,200	3,060	188,000	A.
August	1,170	148	616	37,900	A.
September	145	72	102	6,070	B.
The year	7,970	24	1,490	1,080,000	

TUOLUMNE RIVER NEAR GROVELAND, CAL.

LOCATION.—In the SW. ¼ sec. 24, T. 1 S., R. 17 E., 1 mile below mouth of the South Fork and about 9 miles east of Groveland.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 2, 1907, to September 30, 1914 (not complete).

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AGE.—Gurley water-stage recorder on left bank; a staff in three sections is fastened to rock ledge just above intake and to gage well.

ISCHARGE MEASUREMENTS.—Made from cable one-third mile above gage.

HANNEL AND CONTROL.—Boulders and solid rock; probably permanent.

XTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 12.73 feet at about 4 p. m. January 25 (discharge, 21,000 second-feet); minimum stage from water-stage recorder, 0.58 foot October 29–31 (discharge, 41 second-feet).

1907–1914: Maximum stage recorded, January 14, 1909 (discharge, 27,200 second-feet); minimum stage recorded, October 5, 1912 (discharge, 32 second-feet; record prior to Jan. 1, 1913, incomplete).

IVERSIONS.—See South Fork of Tuolumne River near Groveland.

CCURACY.—Rating curve is well defined and results are excellent.

ischarge measurements of Tuolumne River near Groveland, Cal., during the year ending Sept. 30, 1914.

[Made by Charles Leidl.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec. ft.*
ct. 11	0.86	62	Mar. 25	6.27	3,210	May 20	9.81	11,000
11	.86	59	May 17	9.27	9,230	Sept. 30	1.36	123
n. 10	3.55	763	19	9.62	10,500			

aily discharge, in second-feet, of Tuolumne River near Groveland, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
	80	43	240	3,360	1,920	1,920	1,530	2,620	12,700	7,880	1,440	224
	76	49	238	3,880	1,620	1,820	1,480	3,430	12,100	7,880	1,350	217
	72	66	238	2,170	1,480	1,670	1,920	4,960	11,100	8,120	1,400	217
	72	71	238	1,620	1,350	1,720	3,010	6,530	10,500	7,880	1,350	213
	72	71	238	1,230	1,260	1,920	6,110	7,190	7,880	6,970	1,290	199
	73	68	238	1,050	1,160	2,170	5,330	7,650	6,750	6,530	1,290	185
	72	65	238	980	1,100	2,280	4,440	8,360	5,330	6,320	1,310	172
	64	64	238	1,020	1,070	2,500	3,950	9,130	4,610	5,710	1,210	163
	58	62	238	874	1,020	2,620	3,950	9,130	4,440	5,330	1,080	152
	59	59	233	728	1,010	2,620	6,750	7,190	5,140	4,780	1,060	138
	59	64	201	697	1,060	2,680	4,610	7,190	5,710	4,780	956	126
	58	111	205	679	1,080	2,880	3,880	8,120	7,190	4,780	872	117
	56	158	191	1,480	1,060	2,880	4,110	8,870	7,880	4,780	835	111
	55	205	233	1,770	1,060	2,740	5,140	10,200	8,610	4,440	805	106
	53	252	222	1,670	1,080	2,740	6,110	9,950	9,400	4,610	756	102
	52	258	211	1,440	1,070	3,010	5,520	9,670	9,950	4,440	724	98
	49	264	203	2,170	1,080	3,290	4,780	9,670	11,800	4,780	692	92
	49	270	197	3,360	1,330	3,500	4,960	10,200	13,000	4,610	652	96
	49	276	187	1,670	2,020	3,580	6,110	9,950	14,400	3,950	574	111
	48	282	163	1,310	4,440	3,580	6,530	10,500	12,100	3,800	497	179
	47	289	159	1,230	6,750	3,720	5,330	10,500	11,400	3,360	449	199
	46	295	268	5,710	3,430	3,800	4,360	10,500	10,500	2,940	401	170
	45	241	411	3,790	2,620	3,880	3,650	9,400	8,870	2,620	365	140
	44	188	554	4,610	2,170	3,650	3,220	7,880	9,130	2,560	350	126
	43	134	512	10,800	2,020	3,360	2,880	6,970	7,880	2,440	338	120
	43	231	434	8,120	1,820	3,010	2,880	6,320	6,320	2,380	322	117
	42	235	358	5,140	1,720	2,620	2,680	7,650	6,750	2,280	305	148
	42	242	350	3,580	1,720	2,220	2,560	9,670	7,190	2,170	290	163
	41	242	440	2,740	.....	2,020	2,500	10,800	8,360	1,970	272	140
	41	242	518	2,330	.....	1,870	2,380	12,100	8,360	1,770	260	124
	41	.....	5,910	2,070	.....	1,720	.....	12,400	.....	1,580	245	.....

NOTE.—Discharge determined from a well-defined rating curve. Discharge interpolated Nov. 12–14, 16, , 23, 24, Dec. 23, and Jan. 9.

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Monthly discharge of Tuolumne River near Groveland, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	80	41	54.9	3,380	A.
November	295	43	170	10,100	B.
December	5,910	159	461	28,300	A.
January	10,800	679	2,690	165,000	A.
February	6,750	1,010	1,800	100,000	A.
March	3,880	1,670	2,710	167,000	A.
April	6,750	1,480	4,090	243,000	A.
May	12,400	2,620	8,540	525,000	A.
June	14,400	4,440	8,840	526,000	A.
July	8,120	1,580	4,470	275,000	A.
August	1,440	245	766	47,100	A.
September	224	92	149	8,870	A.
The year	14,400	41	2,900	2,100,000	

TUOLUMNE RIVER NEAR LA GRANGE, CAL.

LOCATION.—In the NE. ¼ SE. ¼ sec. 17, T. 3 S., R. 14 E., at La Grange dam, about 1¼ miles northeast of La Grange.

DRAINAGE AREA.—1,500 square miles.

RECORDS AVAILABLE.—August 30, 1895, to September 30, 1914.

GAGE.—Painted on rock ledge on right bank 80 feet above dam. Zero of gage is at average elevation of crest of dam. Observer, F. A. Townsend.

DISCHARGE.—Computed by means of weir formula from gage heights showing depth of water on crest of curved masonry diversion dam. Coefficient was determined from current-meter measurements made at highway bridge at La Grange, corrected to give discharge at dam. To obtain the total flow of Tuolumne River above La Grange dam it is necessary to combine the flow over the dam with the discharge of Modesto, Turlock, and Yosemite Power Co.'s canals.

EXTREMES OF STAGE.—Maximum stage recorded during year, 16 feet at 7.30 p. m. January 25 (discharge not computed); minimum flow recorded, October 1 to November 12, December 5 to 22, August 15 to September 30; no water going over the dam.

1907–1914: Maximum stage recorded, 16.45 feet on the morning of January 31, 1911, crest of flood from high-water mark on gage (discharge, 60,300 second-feet).

DIVERSIONS.—Modesto and Turlock canals divert at dam. Yosemite Power Co.'s canal heads 13 miles above the dam. The water from the power canal is returned to the river below the dam and about half a mile above the bridge at La Grange. There is also a diversion from South Fork of Tuolumne River at Harden ranch that is not returned to the river.

ACCURACY.—Results good except at extreme low water. The combined record of river and canals is affected by seepage through dam and from canals, by the use of flashboards on the dam for a short period during low stages, by the small amount of water that is occasionally spilled from canals at the waste gates above the gaging stations, and by the water discharged through the ports and sand gates in the dam during certain periods of the year.

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Daily discharge, in second-feet, of Tuolumne River over dam near La Grange, Cal., for the year ending Sept. 30, 1914.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	.....	370	16,800	2,460	2,950	1,110	905	11,400	7,240	589
2	.....	320	7,520	2,000	2,950	1,340	1,580	10,400	6,700	476
3	.....	274	4,700	1,830	2,560	1,830	2,950	9,510	7,520	476
4	.....	114	4,240	1,660	2,370	2,560	5,180	8,930	7,800	589
5	.....	.....	4,020	1,500	2,560	7,520	5,920	7,800	6,180	589
6	.....	.....	3,800	1,420	3,060	6,180	6,180	5,180	5,670	60
7	.....	.....	3,160	1,260	3,370	5,670	6,700	3,370	5,180	0
8	.....	.....	2,180	1,180	3,370	4,700	7,800	2,750	4,700	526
9	.....	.....	2,180	972	3,370	4,020	8,080	2,280	4,470	476
10	.....	.....	2,180	905	3,370	8,930	6,180	2,950	4,020	486
11	.....	.....	2,090	905	3,370	5,420	5,670	3,800	3,800	376
12	.....	.....	1,180	905	3,370	4,020	6,180	6,180	3,800	0
13	210	.....	972	1,500	3,370	3,800	7,240	7,240	3,580	0
14	370	.....	2,950	1,500	3,370	4,700	8,360	7,800	3,370	232
15	320	.....	4,240	1,260	3,370	5,670	8,930	8,930	3,370	0
16	229	.....	2,370	1,040	3,370	5,420	8,640	8,360	3,370	.....
17	149	.....	5,180	972	3,370	4,240	7,800	9,810	3,800	.....
18	149	.....	14,000	1,580	3,800	4,020	8,640	11,400	3,370	.....
19	189	.....	7,240	3,370	3,800	5,180	8,360	10,100	2,950	.....
20	274	.....	3,580	7,520	3,370	5,670	10,100	10,700	2,950	.....
21	320	.....	1,660	20,100	3,370	4,470	10,100	9,510	2,280	.....
22	320	.....	5,920	8,360	3,800	4,020	10,100	8,640	2,180	.....
23	229	411	13,600	6,180	4,240	3,800	7,800	7,800	1,830	.....
24	189	40	7,800	4,700	3,800	2,000	6,700	6,180	1,660	.....
25	149	648	31,200	4,240	3,370	1,500	5,180	6,180	1,500	.....
26	149	401	21,300	3,370	2,750	1,340	4,940	4,700	1,420	.....
27	320	40	10,700	2,950	2,950	1,180	5,180	5,420	1,420	.....
28	421	401	6,180	2,950	2,280	905	8,080	6,180	1,260	.....
29	421	74	4,470	.....	1,580	972	9,810	7,240	1,110	.....
30	421	370	3,800	.....	1,420	838	11,400	7,800	905	.....
31	.....	2,370	2,950	.....	1,260	.....	11,100	.....	710	.....

NOTE.—Discharge determined from a rating curve developed from current-meter discharge measurements and from the weir formula $Q=905\ h^{\frac{3}{2}}$. No water flowing over the dam Oct. 1 to Nov. 12, Dec. 5–22, 1913, and Aug. 16 to Sept. 30, 1914. Water flowing over dam part of day and discharge estimated Nov. 13, Dec. 4, 24, 27, 29, 1913. Flashboards on dam Aug. 6–15, 1914; discharge estimated by comparison with canal records and with Tuolumne River near Groveland. No data on amount of water passing through ports in the dam during low water.

Monthly discharge of Tuolumne River over dam near La Grange, Cal., for the years ending Sept. 30, 1913–14.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0	0	0	0	
November	421	0	161	9,580	C.
December	2,370	0	188	11,600	D.
January	31,200	972	6,590	405,000	B.
February	20,100	905	3,160	176,000	A.
March	4,240	1,260	3,070	189,000	A.
April	8,930	838	3,770	224,000	A.
May	11,400	905	7,150	440,000	A.
June	11,400	2,280	7,280	433,000	A.
July	7,800	710	3,550	218,000	A.
August	589	0	157	9,650	C.
September	0	0	0	0	
The year	31,200	0	2,920	2,120,000	

NOTE.—Estimates do not include water discharging through ports in the dam.

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Combined daily discharge, in second-feet, of Tuolumne River and three canals near Grange, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Se
1	62	58	442	16,800	3,010	3,030	2,210	3,030	13,700	7,990	1,320	
2	62	61	392	7,570	2,590	3,030	2,080	3,760	12,600	7,450	1,210	
3	62	64	336	4,740	2,440	2,640	2,610	5,130	11,800	7,780	1,210	
4	62	67	176	4,290	2,270	2,450	2,940	7,400	11,200	7,860	1,320	
5	62	72	62	4,050	2,080	2,640	8,310	8,100	10,100	6,540	1,400	
6	62	69	62	3,800	1,970	3,140	6,970	8,300	7,380	6,120	1,360	
7	62	69	62	3,220	1,860	3,450	6,430	8,890	5,570	5,880	1,340	
8	62	69	62	2,240	1,780	3,530	4,980	9,990	5,030	5,460	1,260	
9	64	69	62	2,200	1,570	3,800	4,840	10,200	4,480	5,210	1,210	
10	69	69	62	2,240	1,510	3,920	9,840	8,310	5,040	4,560	1,160	
11	72	66	62	2,210	1,510	3,930	6,410	7,830	5,900	4,400	1,120	
12	67	62	62	1,300	1,390	4,000	5,250	8,340	7,170	4,530	1,060	
13	72	272	47	1,260	1,550	3,980	5,320	9,470	7,960	4,310	1,050	
14	72	432	62	3,240	1,600	4,030	6,500	10,600	8,520	4,100	966	
15	72	382	62	4,510	1,630	4,030	7,610	11,200	10,100	4,020	1,250	
16	72	291	62	2,650	1,550	4,050	7,390	10,600	9,860	4,080	869	
17	72	211	62	5,420	1,560	4,060	6,180	10,100	11,700	4,530	801	
18	72	211	62	14,000	2,020	4,860	5,980	10,900	13,600	4,100	776	
19	72	251	62	7,350	3,460	4,860	7,220	10,400	12,300	3,680	715	
20	69	336	62	3,860	7,640	4,640	7,750	11,100	13,000	3,680	647	
21	66	382	62	1,940	20,200	4,710	6,620	11,100	11,700	3,010	588	
22	66	382	59	6,180	8,430	4,960	6,140	11,400	10,900	2,910	527	
23	64	301	473	13,800	6,220	5,240	4,500	10,100	10,000	2,560	453	
24	64	261	102	8,050	4,790	4,900	4,150	8,970	8,390	2,390	423	
25	61	221	704	31,300	4,320	4,520	3,650	7,410	8,460	2,230	398	
26	9	221	454	21,500	3,440	4,010	3,520	7,210	6,910	2,150	382	
27	61	392	102	11,000	3,030	4,250	3,330	7,400	6,180	2,150	359	
28	58	493	463	6,500	3,030	3,580	3,060	9,900	6,940	1,990	346	
29	58	493	136	4,890	.....	2,900	3,120	11,900	8,000	1,840	328	
30	58	493	429	4,240	.....	2,750	2,960	13,700	8,560	1,640	317	
31	58	.....	2,420	3,460	.....	2,610	.....	13,400	.....	1,440	295	.....

NOTE.—Discharge estimated Aug. 6–15, when flashboards were on La Grange dam, by comparison w record of Tuolumne River near Groveland, Cal.

Combined monthly discharge of Tuolumne River and three canals near La Grange, C for the year ending Sept. 30, 1914.

[Drainage area, 1,500 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total acre-fe
October	72	9	63.4	0.042	0.05	3
November	493	58	227	.151	.17	13
December	2,420	47	249	.166	.19	15
January	31,300	1,260	6,770	4.51	5.20	416
February	20,200	1,390	3,520	2.35	2.45	195
March	5,240	2,450	3,820	2.55	2.94	235
April	9,840	2,080	5,260	3.51	3.92	313
May	13,700	3,030	9,230	6.15	7.09	568
June	13,700	4,480	9,100	6.07	6.77	541
July	7,990	1,440	4,210	2.81	3.24	259
August	1,400	295	853	.569	.66	52
September	297	132	195	.130	.14	11
The year	31,300	9	3,630	2.42	32.82	2,620

NOTE.—Combined estimates of river and canals do not include seepage losses from dam and canal water discharged through ports of the dam or occasionally spilled from canals at the waste gates above gages. Natural run-off is affected somewhat by some small storage at the dam at low water.

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CHERRY CREEK NEAR SEQUOIA, CAL.

LOCATION.—In the SW. ¼ sec. 28, T. 2 N., R. 19 E., in Stanislaus National Forest, at abandoned sawmill camp, 3 miles by trail from Lake Eleanor, and about 13 miles north of Sequoia.

DRAINAGE AREA.—114 square miles[1] (above dam site about 2 miles below station in sec. 5, T. 1 N., R. 19 E.).

RECORDS AVAILABLE.—April 1, 1910, to September 30, 1914.

GAGE.—Lietz water-stage recorder on left bank at suspension trail bridge, with vertical staff in two sections at same site. October 22, 1913, gage was moved upstream 800 feet. Original datum not maintained.

DISCHARGE MEASUREMENTS.—Made from upstream side of bridge or by wading.

CHANNEL AND CONTROL.—Fine gravel and sand; fairly permanent at original location. New site is above a solid rock dike which extends across the channel, and forms a permanent control.

EXTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 7.3 feet May 31 (discharge, 2,800 second-feet); minimum stage from water-stage recorder, 4.78 feet October 1 to 9 and 20 to 30 (discharge, 1 second-foot).

1910–1914: Maximum discharge recorded, (7,000 second-feet, January 30, 1911); channel dry September 6 to 12, 1910.

WINTER FLOW.—Stage-discharge relation not affected by ice.

ACCURACY.—Rating curve well defined; results excellent.

COOPERATION.—Records to April 30, 1914, furnished by city of San Francisco. Since May 1, 1914, station has been maintained by the United States Geological Survey in cooperation with the city of San Francisco through M. M. O'Shaughnessy, city engineer.

Discharge measurements of Cherry Creek near Sequoia, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 3	Lasley Lee	4.62	1,060	June 26	Lasley Lee	4.51	1,010
4	do	5.21	1,320	July 13	do	4.06	793
6	do	5.31	1,420	26	do	2.88	326
15	W. V. Hardy	6.42	2,100	31	R. C. Rice	2.54	208
16	do	5.70	1,560	Aug. 7	Lasley Lee	2.28	121
18	do	5.72	1,600	21	do	1.73	41
29	Lasley Lee	6.12	1,910	22	do	1.67	36
29	do	5.97	1,820	27	do	1.41	21
June 8	do	3.64	613	Sept 14	do	1.03	4.5
18	do	6.73	2,360				

[1] Freeman J. R., the Hetch Hetchy water supply for San Francisco, 1912, p. 24.

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Daily discharge, in second-feet, of Cherry Creek near Sequoia, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1	1	72	1,560	287	295	216	556	2,460	1,410	182	16
2	1	39	74	828	284	313	253	784	2,230	1,470	158	15
3	1	21	62	444	260	331	429	1,360	2,080	1,360	147	14
4	1	14	55	316	253	350	872	1,500	2,010	1,260	142	13
5	1	14	51	277	223	369	1,200	1,560	1,500	1,160	133	12
6	1	15	56	236	176	388	917	1,680	963	1,130	131	11
7	1	13	66	220	179	410	784	1,800	917	1,030	128	9.5
8	1	9	75	213	176	440	678	2,010	741	986	120	8.5
9	1	2	64	158	164	474	1,010	1,920	720	872	108	8
10	2	33	59	139	176	400	1,180	1,840	895	828	99	7
11	2	113	55	128	185	426	699	1,760	963	850	90	6.5
12	2	99	55	144	188	552	678	1,680	1,620	828	84	6.5
13	2	81	53	260	188	536	850	1,870	1,800	814	83	5
14	3	70	66	556	197	512	1,100	2,230	2,080	801	79	4.5
15	2	63	62	410	210	544	1,230	2,230	2,380	788	73	4
16	2	51	55	267	194	636	1,060	2,010	2,160	775	67	3.5
17	2	42	49	153	200	741	894	1,940	2,720	762	62	3.5
18	2	38	44	150	236	828	1,130	2,010	2,630	741	57	22
19	2	56	41	170	312	762	1,300	1,940	2,540	616	52	31
20	1	70	40	173	741	720	1,160	2,080	2,460	516	47	18
21	1	88	41	191	678	741	850	1,920	2,300	470	42	14
22	1	83	45	616	291	741	678	1,770	2,080	413	37	13
23	1	77	52	301	243	762	576	1,620	1,740	392	34	12
24	1	74	86	373	226	699	482	1,360	2,080	372	31	11
25	1	99	101	1,870	226	636	489	1,300	1,500	352	28	11
26	1	88	90	1,130	226	556	467	1,160	1,200	334	26	11
27	1	101	118	678	233	448	391	1,560	1,260	316	23	10
28	1	103	106	497	277	355	377	1,870	1,300	298	20	9
29	1	97	103	388	.....	308	334	2,380	1,460	274	18	8
30	1	88	188	170	.....	260	388	2,720	1,620	240	18	7.5
31	2	.....	1,560	312	.....	233	.....	2,800	.....	207	16	.....

NOTE.—Discharge determined as follows: Oct. 1–31, 1913, record furnished by city of San Francisco; Nov. 1, 1913, to Sept. 30, 1914, from a well-defined rating curve developed from measurements made since May 1, 1914; Nov. 16–21, estimated; Mar. 1–5, 10, 11, and 29; May 9–11, 21, and 22; June 29; July 3, 4, 13–16, 23, and 24; and Aug. 15–21, interpolated.

Monthly discharge of Cherry Creek near Sequoia, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	3	1	1.4	85	
November	113	1	58.1	3,460	
December	1,560	40	118	7,260	
January	1,870	128	430	26,400	
February	741	164	258	14,300	
March	828	233	509	31,300	
April	1,300	216	756	45,000	
May	2,800	556	1,780	109,000	A.
June	2,720	720	1,750	104,000	A.
July	1,470	207	731	44,900	A.
August	182	16	75.3	4,630	A.
September	31	3	10.8	643	A.
The year	2,800	1	541	391,000	

ELEANOR CREEK NEAR SEQUOIA, CAL.

LOCATION.—In the SW. ¼ SE. ¼ sec. 34, T. 2 N., R. 19 E., in Yosemite National Park, 500 feet above trail bridge, half a mile below Lake Eleanor, and about 12 miles north of Sequoia.

DRAINAGE AREA.—79 square miles[1] (above dam site about three-fourths mile below station in sec. 3, T. 1 N., R. 19 E.).

RECORDS AVAILABLE.—November 20, 1909, to September 30, 1914.

GAGE.—Lietz water-stage recorder on right bank with a vertical staff in two sections a short distance upstream.

[1] *Freeman, J. R.* the Hetch Hetchy water supply for San Francisco, 1912, p. 24.

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SCHARGE MEASUREMENTS.—Made from cable at gage or by wading.

ANNEL AND CONTROL.—Boulders and gravel; fairly permanent.

XTREMES OF DISCHARGE.—Maximum stage during year from water-stage recorder, 8.02 feet January 1 (discharge, 1,690 second-feet); minimum stage from water-stage recorder, 1.04 feet October 26 to 29 (discharge, 0.2 second-foot).

1910–1914: Maximum stage recorded, 13.1 feet January 30, 1911 (discharge, 5,000 second-feet); channel dry September 8 to 14, 1910.

NTER FLOW.—Stage-discharge relation not affected by ice.

CCURACY.—Rating curve well defined; results excellent.

OOPERATION.—Complete records to April 30, 1914, furnished by city of San Francisco; since May 1, 1914, station has been maintained by United States Geological Survey in cooperation with city of San Francisco through M. M. O'Shaughnessy, city engineer.

Discharge measurements of Eleanor Creek near Sequoia, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
May 3	Lasley Lee	5.45	739	July 26	Lasley Lee	2.75	118
16	W. V. Hardy	6.59	1,110	31	do	2.48	88
17	do	6.35	973	Aug. 7	do	2.15	55
20	do	6.37	1,050	21	do	1.67	24
June 26	Lasley Lee	4.70	511	28	do	1.49	15
July 2	do	4.44	455	31	do	1.44	12
7	do	4.06	363	Sept. 15	do	1.21	3.7
13	do	3.54	247				

Daily discharge, in second-feet, of Eleanor Creek near Sequoia, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4	0.5	55	1,690	295	239	234	357	1,080	464	82	11
2	4	.5	49	1,240	267	250	225	477	986	440	76	10
3	4	.5	43	883	243	247	252	725	954	440	70	9.5
4	4	.5	44	534	222	248	417	986	890	428	66	9
5	4	.5	47	398	208	265	1,020	1,050	800	404	63	8.5
6	4	.5	48	339	196	309	1,090	1,050	624	380	60	7.5
7	3	.5	48	295	184	345	869	1,080	542	357	57	6.5
8	3	.5	48	267	174	387	709	1,150	529	335	54	5.5
9	5	.5	48	232	166	419	678	1,080	477	313	51	5.5
10	4	1	48	196	163	438	1,230	860	440	280	48	5.5
11	4	1	47	174	163	448	937	800	452	270	46	5
12	3	2	46	164	168	472	709	860	516	260	44	4
13	3	3	44	196	169	492	695	970	582	250	42	3.5
14	2	4	42	247	171	467	816	1,080	624	240	38	3.5
15	2	5	42	248	174	458	991	1,190	740	236	37	3.5
16	1	6	43	238	177	492	944	1,120	770	234	35	3
17	1	7	43	230	177	546	782	1,020	800	240	33	3
18	1	9	43	238	191	596	758	1,020	860	240	31	3
19	1	10	42	225	222	604	886	986	830	232	28	3
20	1	13	43	211	318	601	951	1,020	770	206	27	3
21	1	15	46	201	578	604	782	1,020	710	188	25	3
22	.5	18	47	366	448	604	626	1,020	680	168	24	3
23	.5	23	50	400	348	604	517	890	624	151	22	3
24	.5	28	52	384	289	582	441	922	624	138	20	3
25	.5	35	60	807	257	544	389	922	680	127	19	3
26	.2	42	67	1,560	239	492	373	830	555	120	18	3
27	.2	46	77	1,130	230	422	366	800	464	112	17	3
28	.2	51	79	712	225	357	359	860	440	106	15	3
29	.2	57	81	509	.....	326	348	954	452	101	14	2.5
30	.5	60	88	400	.....	301	335	1,080	477	94	14	2.5
31	.5	.....	322	335	.....	256	.....	1,120	.....	88	12	.....

NOTE.—Record of daily discharge prior to May 1 furnished by city of San Francisco; discharge after May determined from a well-defined rating curve. Discharge interpolated May 13 and 14, Aug. 20, 21, 27, and

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Monthly discharge of Eleanor Creek near Sequoia, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	5	0.2	2.03	125	
November	60	.5	14.7	875	
December	322	42	60.7	3,730	
January	1,690	164	485	29,800	
February	578	163	238	13,200	
March	604	239	433	26,600	
April	1,230	225	658	39,200	
May	1,190	357	945	58,100	A.
June	1,080	440	666	39,600	A.
July	464	88	247	15,200	A.
August	82	12	38.3	2,360	A.
September	11	2.5	4.73	281	A.
The year	1,690	0.2	316	229,000	

JAWBONE CREEK NEAR TUOLUMNE, CAL.

LOCATION.—In the NE. ¼ sec. 33, T. 1 N., R. 18 E., at Jawbone ranger station, in Stanislaus National Forest, about 1 mile above junction with Tuolumne River, 14 miles southeast of Tuolumne, and 12 miles northeast of Groveland.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 13, 1910, to September 30, 1914 (fragmentary).

GAGE.—Vertical staff in two sections fastened to an alder tree on right bank 100 feet below trail crossing. Observer, B. F. Tyler.

DISCHARGE MEASUREMENTS.—Made from footbridge about 1,000 feet below gage, or by wading.

CHANNEL AND CONTROL.—Gravel and boulders; will shift during high water.

EXTREMES OF STAGE.—Maximum stage recorded during year 1.4 feet January 1 (discharge, 90 second-feet); minimum stage recorded, —0.58 foot November 16 (discharge, 1.1 second-feet).

1910–1914: Maximum stage recorded, 3.72 feet January 30, 1911; minimum stage recorded, —0.66 foot August 31, 1913 (discharge, 0.7 second-foot; record incomplete).

WINTER FLOW.—Stage-discharge relation possibly affected by ice.

DIVERSIONS.—Small irrigation ditch at ranger station above the gage.

ACCURACY.—Rating curve not well defined; results fair for days on which gage was read.

COOPERATION.—Station maintained in cooperation with United States Forest Service.

The following discharge measurement was made by Lasley Lee:

August 24, 1914: Gage height, —0.37 foot; discharge, 4.5 second-feet.

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Daily discharge, in second-feet, of Jawbone Creek near Tuolumne, Cal., for the year ending Sept. 30, 1914.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1			90						8.6	6.0	
2			60			37		22			
3							37	18			
4			43				36	18			
5		1.2	43			97				5.6	
6			40			70					4.4
7			37		49				8.6		4.2
8		1.4	43							5.4	
9			37	17		63					
10		1.2		19					7.2	5.4	4.2
11	2.4										
12	1.7										
13	1.5			16						5.2	
14	1.5	1.6									
15	1.2	1.5		15							
16	1.1				49					4.6	4.0
17	1.2										
18	1.2					56					
19	2.0			37	63						
20	2.0	1.7		122		56		14		4.6	
21	1.6	1.5						11			
22	1.5	13		78		56				4.6	
23	1.4	2.0									4.0
24		2.0		63		49	32			4.6	
25		12		56	56					4.4	
26		4.0		52							
27		2.6									
28	2.5	2.2	56								
29	2.0		55		46					4.4	
30	1.8		46							4.0	
31			43								

NOTE.—Discharge determined from a poorly-defined rating curve.

SOUTH FORK OF TUOLUMNE RIVER NEAR SEQUOIA, CAL.

LOCATION.—In NW. ¼ sec. 31, T. 1 S., R. 19 E., at highway bridge at sawmill, 600 feet above Hazel Green Creek, 1 mile above intake of Golden Rock Ditch, and 3 miles west of Sequoia.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—January 11 to September 30, 1914.

GAGE.—Vertical staff fastened to downstream end of right abutment of bridge. Observer, J. J. Scofield.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Gravel and boulders; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 8.0 feet January 25 (discharge determined from an extension of the rating curve, 3,510 second-feet); minimum stage recorded, 1.2 feet August 17 to September 30 (discharge, 8.7 second-feet).

ACCURACY.—Results are good except for extremely high water.

COOPERATION.—Gage-height record furnished by Yosemite Power Co., through H. A. Kluegel, chief engineer.

Discharge measurements of South Fork of Tuolumne River near Sequoia, Cal., during the year ending Sept. 30, 1914.

[Made by Charles Leidl.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Jan. 11	1.90	46	May 18	2.99	325
Mar. 6	2.62	219	Sept. 29	1.18	8

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Daily discharge, in second-feet, of South Fork of Tuolumne River near Sequoia, Cal., fo the year ending Sept. 30, 1914.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	.....	146	189	146	189	346	72	18	8.7
2	.....	136	178	156	213	267	72	14	8.7
3	.....	110	167	167	282	267	65	14	8.7
4	.....	102	156	239	297	213	58	14	8.7
5	.....	178	178	473	282	201	52	14	8.7
6	.....	189	189	380	297	178	52	14	8.7
7	.....	167	201	313	313	178	46	14	8.7
8	.....	79	213	282	313	156	46	14	8.7
9	.....	86	226	282	380	156	46	14	8.7
10	.....	86	213	494	282	156	41	14	8.7
11	250	86	213	346	297	156	41	14	8.7
12	34	86	213	313	346	156	36	14	8.7
13	352	102	226	297	380	156	36	12	8.7
14	182	86	201	346	397	156	36	12	8.7
15	170	86	201	380	329	156	31	12	8.7
16	128	102	213	329	329	146	31	12	8.7
17	316	86	226	313	313	146	31	8.7	8.7
18	334	102	239	346	313	146	31	8.7	8.7
19	159	86	253	416	313	136	31	8.7	12
20	148	416	297	380	313	146	26	8.7	8.7
21	82	1,300	297	346	313	136	26	8.7	8.7
22	1,040	645	282	297	313	118	26	8.7	8.7
23	282	189	267	239	313	110	26	8.7	8.7
24	700	282	239	226	267	118	22	8.7	8.7
25	3,510	226	239	226	313	110	22	8.7	8.7
26	735	213	213	213	239	102	22	8.7	8.7
27	434	201	201	201	239	86	22	8.7	8.7
28	282	189	178	201	267	86	22	8.7	8.7
29	213	.....	178	201	329	79	18	8.7	8.7
30	329	.....	178	189	313	79	18	8.7	8.7
31	297	.....	156	.....	380	.....	18	8.7	.....

NOTE.—Daily discharge determined from rating curves as follows: Jan. 11 to 25, fairly well defined below 400 second-feet; Jan. 26 to Sept. 30, well defined below 400 second-feet. Discharges above 1,000 second-feet are only approximate, as no measurements at or above such a stage have been obtained.

Monthly discharge of South Fork of Tuolumne River near Sequoia, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January 11–31	3,510	34	475	19,800	C.
February	1,300	79	206	11,400	B.
March	297	156	214	13,200	A.
April	494	146	291	17,300	A.
May	397	189	305	18,800	A.
June	346	79	155	9,220	A.
July	72	18	36.2	2,230	A.
August	18	8.7	11.3	695	B.
September	12	8.7	8.81	524	B.
The period	.....	.....	.....	93,200	

SOUTH FORK OF TUOLUMNE RIVER NEAR GROVELAND, CAL.

LOCATION.—At South Fork trail bridge, in Stanislaus National Forest, one-fourth mile above junction with Tuolumne River and 9 miles east of Groveland. The Middle Fork enters about 2½ miles above the station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 13, 1910, to September 30, 1914 (fragmentary).

GAGE.—Vertical staff on middle pier of bridge at downstream end; May 19, 1914, an inclined staff was fastened to a large boulder on right bank about 600 feet above *trail bridge.* Observer, B. F. Tyler.

CHANNEL AND CONTROL.—Boulders and gravel; very rough.

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XTREMES OF STAGE.[1]—Maximum stage recorded during year, 4.6 feet January 24 (discharge, 2,200 second-feet. A camper at the bridge said that on January 25 the water touched the stringers of the bridge; estimated stage between 8.0 and 10.0 feet); minimum stage recorded, 0.75 foot October 4 and 12 (discharge, 4 second-feet).

1910–1914: Maximum stage estimated between 8 and 10 feet January 25, 1914 (see paragraph above); minimum stage recorded, 0.35 foot August 24, 1912.

ISCHARGE MEASUREMENTS.—Made from cable 20 feet above bridge or by wading.

IVERSIONS.—At the Harden ranch, 7 miles above the mouth, water is diverted for irrigation and domestic use at Groveland and Big Oak Flat and is not returned to the river.

CCURACY.—Rating curve fairly well defined at medium and low stages; results fair for days on which gage was read.

OOPERATION.—Station maintained in cooperation with United States Forest Service.

ischarge measurements of South Fork of Tuolumne River near Groveland, Cal., during the year ending Sept. 30, 1914.

[Made by Charles Lidl.]

Date.	Gage height (a).	Gage height (b).	Discharge.	Date.	Gage height (a).	Gage height (b).	Discharge.
	Feet.	*Feet.*	*Sec.-ft.*		*Feet.*	*Feet.*	*Sec.-ft.*
ct. 11	0.83	.....	6.3	May 20	3.52	5.99	1,140
n. 10	1.22	.....	73	Sept. 30	.40	2.48	7.3
ay 19	3.30	5.75	905				

[a] Old gage on middle pier of bridge. [b] New gage installed May 19, 1914.

)aily discharge, in second-feet, of South Fork of Tuolumne River near Groveland, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	.....	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	.....	.....	.....	.....	.....	.....	.....	310	.....	.....	.....	.....
3	.....	.....	.....	215	.....	.....	.....	.....	1,640	.....	.....	.....
4	4	.....	.....	.....	.....	.....	1,100	.....	710	133	.....	.....
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
6	.....	.....	20	.....	.....	.....	.....	.....	550	.....	.....	.....
7	.....	.....	.....	.....	.....	480	.....	.....	.....	.....	.....	.....
8	.....	.....	23	.....	.....	.....	.....	.....	.....	.....	.....	.....
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	5	.....	.....	70	.....	.....	.....	850	550	.....	.....	8
11	7	.....	.....	.....	.....	.....	.....	.....	550	133	.....	.....
12	4	.....	.....	88	.....	.....	.....	.....	.....	.....	.....	.....
13	5	.....	31	.....	.....	.....	.....	.....	.....	.....	.....	.....
14	.....	.....	.....	.....	.....	530	.....	970	.....	.....	.....	.....
15	8	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
16	.....	.....	.....	.....	.....	.....	.....	850	.....	.....	.....	.....
17	.....	15	.....	930	.....	.....	.....	.....	.....	.....	.....	.....
18	5	.....	.....	.....	.....	.....	930	.....	.....	.....	.....	.....
19	.....	.....	.....	.....	.....	.....	.....	935	.....	.....	.....	.....
20	.....	23	25	310	.....	.....	.....	1,130	600	.....	.....	.....
21	.....	.....	.....	.....	1,570	.....	.....	.....	.....	.....	.....	.....
22	.....	.....	.....	.....	.....	.....	.....	.....	1,050	.....	.....	.....
23	.....	.....	.....	.....	.....	.....	.....	1,280	970	.....	.....	.....
24	.....	.....	.....	2,200	.....	.....	.....	.....	.....	.....	8	.....
25	.....	23	.....	.....	.....	480	530	.....	.....	.....	.....	.....
26	.....	.....	.....	710	.....	.....	.....	.....	.....	.....	.....	.....
27	.....	.....	41	480	.....	.....	.....	.....	415	.....	.....	.....
28	.....	.....	.....	.....	430	430	.....	.....	.....	.....	.....	.....
29	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
30	.....	25	.....	.....	.....	.....	.....	1,010	.....	.....	.....	8
31	.....	.....	.....	310	.....	350	.....	.....	.....	.....	.....	.....

[1] Record consists of occasional readings.

NOTE.—Discharge determined from two fairly well defined rating curves.

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GOLDEN ROCK DITCH NEAR SEQUOIA, CAL.

LOCATION.—In sec. 35, T. 1 S., R. 18 E., about 800 feet below diversion dam on South Fork of Tuolumne River, 4 miles west of Sequoia.

RECORDS AVAILABLE.—January 1 to September 30, 1914.

GAGE.—Vertical staff fastened to left side of flume 800 feet below head gate.

DISCHARGE MEASUREMENTS.—Made from foot plank across flume at gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 1.6 feet during parts of April and May (discharge, 22 second-feet); ditch dry January 25 to March 16.

ACCURACY.—Rating curve is well defined and results are excellent.

COOPERATION.—Station maintained in cooperation with Yosemite Power Co., through H. A. Kluegel, chief engineer.

Discharge measurements of Golden Rock ditch near Sequoia, Cal., during the period Aug. 17, 1913, to Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Aug. 17	Yosemite Power Co....	1.03	6.8	Mar. 26	Charles Leidl.....	1.00	6.2
21	.....do.....	.94	5.2	May 18	.....do.....	1.58	21
Jan. 11	Charles Leidl.....	1.37	14.4	Sept. 29	.....do.....	1.06	7.0

Daily discharge, in second-feet, of Golden Rock ditch near Sequoia, Cal., for the year ending Sept. 30, 1914.

Day.	Jan.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	18	.....	10	18	18	15	15	7.9
2	18	.....	10	18	18	15	a 14	a 7.9
3	15	.....	10	18	18	15	12	7.9
4	15	.....	a 16	a 18	18	15	15	a 7.9
5	a 14	.....	22	18	18	12	12	7.9
6	a 13	.....	a 22	22	18	12	12	7.9
7	a 12	.....	22	20	18	12	12	7.9
8	a 11	.....	18	22	18	12	12	a 7.9
9	10	.....	22	a 20	18	a 12	a 12	7.9
10	a 11	.....	22	18	18	12	12	7.9
11	a 13	.....	a 22	18	a 18	12	12	a 7.9
12	15	.....	22	20	18	a 12	a 12	7.9
13	18	.....	18	22	18	12	12	a 7.9
14	18	.....	a 20	a 21	18	12	a 11	a 7.9
15	18	.....	22	20	a 16	12	10	7.9
16	a 18	.....	22	22	15	12	a 10	7.9
17	18	6.2	18	a 20	18	12	10	a 9.0
18	18	6.2	18	18	15	12	10	10
19	a 16	6.2	a 20	20	15	a 12	10	a 9.0
20	15	6.2	22	a 19	15	12	a 10	7.9
21	a 18	6.2	22	18	15	12	10	a 7.9
22	22	6.2	a 20	a 18	15	a 12	10	7.9
23	18	a 6.2	18	18	15	12	a 9.0	a 7.9
24	22	6.2	a 18	18	15	12	7.9	7.9
25	.....	6.2	18	a 18	15	a 14	a 7.9	a 7.9
26	.....	10	18	18	15	15	7.9	7.9
27	.....	10	18	18	15	12	7.9	a 7.6
28	.....	10	a 18	18	15	12	a 7.9	a 7.3
29	.....	10	18	20	15	12	7.9	7.0
30	.....	10	a 18	20	15	12	a 7.9	7.0
31	.....	10	.....	a 19	.....	12	7.9	.....

a Interpolated.

NOTE.—Discharge determined from a well-defined rating curve. No record from October through December; ditch dry Jan. 25 to Mar. 16.

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nthly discharge of Golden Rock ditch near Sequoia, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
nuary	22	.0	12.4	762	A.
ebruary	.0	.0	.0	0	
arch	10	.0	3.74	230	A.
pril	22	10	18.8	1,120	A.
ay	22	18	19.2	1,180	A.
une	18	15	16.5	982	A.
uly	15	12	12.5	769	A.
ugust	15	7.9	10.6	652	A.
eptember	10	7	7.95	473	A.
The period				6,170	

YOSEMITE POWER CO.'S CANAL NEAR LA GRANGE, CAL.

LOCATION.—At the short flume opposite La Grange dam, on left bank of Tuolumne River, just above waste gate, about three-fourths mile above power house and 1¼ miles northeast of La Grange.

RECORDS AVAILABLE.—1908 to September 30, 1914 (not complete).

GAGE.—Vertical staff on right side of flume near upper end. Observer, H. T. Sackett.

DISCHARGE MEASUREMENTS.—Made in flume just below gage.

EXTREMES OF DISCHARGE.—1910–1914: Maximum stage recorded, full head 2.9 feet (discharge, 66 second-feet) at various times of most every year; canal dry during periods of the year.

ACCURACY.—Rating curve well defined; results excellent.

COOPERATION.—Gage-height record furnished by Turlock irrigation district, through R. V. Meikle, chief engineer.

The Yosemite Power Co.'s canal takes water from the south side of Tuolumne River at Indian Bar, about 15 miles above the town of La Grange. This canal was built in the early days to supply water for hydraulic mining in the vicinity of La Grange, and is now locally known as the "La Grange mining ditch." Recently it has been thoroughly repaired and is now used as a supply canal for the hydroelectric plant which was installed in the latter part of 1907. The power house is about half a mile above the town of La Grange and is below the dam and headworks of the Turlock and Modesto irrigation canals.

Discharge measurements of Yosemite Power Co.'s canal near La Grange, Cal., during the year ending Sept. 30, 1914.

[Made by H. D. McGlashan.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
May 20	0.53	6.2
21	2.88	65

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Daily discharge, in second-feet, of Yosemite Power Co.'s canal near La Grange, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	62	53	62	24	56	62	56	62	66	62	59	62
2	62	56	62	50	62	56	62	62	66	62	59	62
3	62	59	62	44	62	62	62	62	66	62	62	62
4	62	62	62	53	62	62	62	62	66	62	62	62
5	62	62	62	34	62	62	62	62	66	62	62	62
6	62	62	62	0	59	62	62	0	66	62	7	62
7	62	62	62	62	59	56	62	66	66	24	62	62
8	62	62	62	62	56	62	62	66	66	66	62	62
9	62	62	62	17	56	62	62	62	66	66	62	62
10	62	62	62	62	56	62	62	66	62	66	2	62
11	62	62	62	62	56	38	62	66	62	62	62	62
12	62	62	62	62	53	62	62	66	6	62	62	62
13	62	62	47	53	53	47	0	66	66	62	62	62
14	62	62	62	56	56	62	62	66	62	62	62	62
15	62	62	62	32	56	62	62	66	66	62	62	62
16	62	62	62	53	59	63	62	62	66	62	62	62
17	62	62	62	56	59	65	62	66	66	62	62	62
18	62	62	62	0	62	66	62	66	66	62	62	62
19	62	62	62	0	47	66	62	66	66	62	62	62
20	62	62	62	53	50	10	62	8	66	62	62	62
21	59	62	62	56	3	62	62	66	62	62	62	66
22	59	62	59	32	38	62	62	66	66	62	62	62
23	59	62	62	0	6	62	62	66	66	62	62	62
24	59	62	62	25	56	62	62	66	66	59	62	62
25	56	62	56	0	59	62	62	66	66	62	62	62
26	4	62	53	0	53	62	62	66	66	62	62	62
27	56	62	62	17	56	62	62	62	66	62	62	62
28	53	62	62	50	59	62	62	66	66	62	62	62
29	53	62	62	53	.....	62	62	66	66	62	62	62
30	53	62	59	53	.....	62	62	66	64	62	62	62
31	53	.....	50	53	.....	59	.....	66	.....	62	62	.....

NOTE.—Discharge May 20 computed by weighting, according to duration, discharge for 6 selected periods in the day. No water in canal Jan. 6, 18, 19, 23, 25, 26, Apr. 13, and May 6. No record, discharge interpolated, Oct. 29, Nov. 19, Feb. 27 and 28, Mar. 16, 17, and 27, Apr. 3–7 and 20, May 22, June 5 and 30, and Sept. 6.

Monthly discharge of Yosemite Power Co.'s canal near La Grange, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	62	4	58.2	3,580	A.
November	62	53	61.4	3,650	A.
December	62	47	60.5	3,720	A.
January	62	0	37.9	2,330	A.
February	62	3	52.5	2,920	A.
March	66	10	59.0	3,630	A.
April	62	0	59.7	3,550	A.
May	66	0	61.0	3,750	A.
June	66	6	63.4	3,770	A.
July	66	24	61.1	3,760	A.
August	62	2	58.1	3,570	A.
September	66	62	62.1	3,700	A.
The year	66	0	57.9	41,900	

MODESTO CANAL NEAR LA GRANGE, CAL.

LOCATION.—In the SE. ¼ sec. 17, T. 3 S., R. 14 E., near intake at La Grange dam, on right bank of Tuolumne River, about 1¼ miles northeast of La Grange.

RECORDS AVAILABLE.—April 26, 1903, to September 30, 1914.

GAGE.—Vertical iron staff in concrete well on left bank, 460 feet below head gates and below waste gates.

DISCHARGE MEASUREMENTS.—Made from footbridge 550 feet below gage. This section of the canal is lined with concrete.

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EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.2 feet June 18 to July 2 (discharge, 691 second-feet); canal dry October 1 to 8, November 12 to 22, December 3 to January 10, July 4 and September 10 to 30.

1903–1914: Maximum stage recorded, 4.5 feet June 11, 1912 (discharge, 726 second-feet); canal dry during periods in every year.

ACCURACY.—Rating curves fairly well defined; results good. Discharge measurements made during 1914 show that the discharge for same gage height was slightly less than in previous years, owing to accumulation of rock débris in the deep cut below the gaging section. Above this point the rock which slides into the canal during the rainy season is occasionally removed.

COOPERATION.—Gage-height record furnished by Modesto irrigation district, through F. A. Townsend, patrolman.

Discharge measurements of Modesto canal at La Grange, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Apr. 12	Modesto irrigation district	0.99	99	May 22	H. D. McGlashan	3.95	624
12	do	2.00	268	29	do	.98	94
12	do	3.10	476	29	do	1.79	240
18	do	3.95	637	29	do	2.83	428
May 20	H. D. McGlashan	3.95	634	29	do	3.56	560
				29	do	4.05	670

Daily discharge, in second-feet, of Modesto canal near La Grange, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	.....	5	10	.....	490	22	375	640	653	691	672	70
2	.....	5	10	.....	526	22	9	640	653	691	672	66
3	.....	5	.....	.....	545	22	48	640	653	199	672	66
4	.....	5	.....	.....	545	22	55	640	653	.....	672	69
5	.....	10	.....	.....	518	22	55	640	653	298	672	62
6	.....	7	.....	.....	490	22	55	640	653	387	653	56
7	.....	7	.....	.....	545	22	55	640	653	672	672	53
8	.....	7	.....	.....	545	96	55	640	653	691	672	47
9	2	7	.....	.....	545	364	55	640	653	672	672	36
10	7	7	.....	.....	545	490	55	640	653	476	672	.....
11	10	4	.....	55	545	526	76	640	653	539	672	.....
12	5	.....	.....	55	431	564	274	640	653	672	672	.....
13	10	.....	.....	238	.....	564	490	640	653	672	653	.....
14	10	.....	.....	238	39	602	564	640	653	672	672	.....
15	10	.....	.....	238	310	602	564	640	672	588	577	.....
16	10	.....	.....	229	454	621	602	299	672	653	257	.....
17	10	.....	.....	188	526	621	602	640	672	672	239	.....
18	10	.....	.....	.....	376	621	621	640	691	672	239	.....
19	10	.....	.....	114	46	621	640	640	691	672	203	.....
20	7	.....	.....	229	72	621	640	640	691	672	185	.....
21	7	.....	.....	229	49	621	640	640	691	672	176	.....
22	7	.....	.....	229	32	427	640	640	691	672	148	.....
23	5	10	.....	229	32	273	640	640	691	672	127	.....
24	5	10	.....	229	32	364	640	640	691	672	117	.....
25	5	10	.....	134	22	438	640	640	691	672	110	
26	5	10	.....	194	22	524	640	640	691	672	103	.....
27	5	10	.....	274	22	564	640	640	691	672	98	.....
28	5	10	.....	274	22	564	640	194	691	672	94	.....
29	5	10	.....	364	.....	602	640	443	691	672	84	.....
30	5	10	.....	391	.....	602	640	653	691	672	81	.....
31	5	.....	.....	454	.....	621	.....	653	.....	672	75	.....

NOTE.—Daily discharge determined from well-defined rating curves applicable as follows: Oct. 1, 1913, to May 28, 1914, and May 29 to Sept. 30, 1914. No water in canal Oct. 1–8, Nov. 12–22, Dec. 3, 1913, to Jan. 10, 14, Jan. 18, Feb. 13, July 4, and Sept. 10–30, 1914. Water in canal part of day, discharge estimated, Oct. 9, Nov. 11, 1913, Jan. 17, 19, 25, 26, Feb. 5, 12, 14, 18, 19, Mar. 8, 22, 25, 26, Apr. 1, 2, 3, May 16, 29, 30, July 3, 5, 10, 15, and Sept. 9, 1914.

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Monthly discharge of Modesto canal near La Grange, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	10	0	5.2	320	B.
November	10	0	5.0	298	B.
December	10	0	0.6	37	B.
January	454	0	148	9,100	B.
February	545	0	297	16,500	A.
March	621	22	409	25,100	A.
April	640	9	410	24,400	A.
May	653	194	609	37,400	A.
June	691	653	671	39,900	A.
July	691	0	601	37,000	A.
August	672	75	396	24,300	A.
September	70	0	17.5	1,040	B.
The year	691	0	298	215,000	

TURLOCK CANAL NEAR LA GRANGE, CAL.

LOCATION.—Below intake tunnel on left bank of Tuolumne River at La Grange dam, about 1¼ miles northeast of La Grange.

RECORDS AVAILABLE.—July, 1899, to September 30, 1914.

GAGE.—Vertical staff float in concrete well, 150 feet below tunnel and below the spillway. Observer, H. T. Sackett.

DISCHARGE MEASUREMENTS.—Made from foot plank across lined section of canal at Snake Ravine, about 1 mile below gage.

EXTREMES OF DISCHARGE.—1907–1914: Maximum stage recorded, 7.4 feet May 14 to 18, 23, 24, 26, 28 to June 5, and June 8, 1914 (discharge, 1,560 second-feet); canal dry October 1 to March 18, April 23, June 27 to August 4, August 8 to 10 and 14, 1914, and parts of every year.

ACCURACY.—Canal enlarged during winter of 1913–14; new rating curve well defined; results good.

COOPERATION.—Gage-height record furnished by Turlock irrigation district, through R. V. Meikle, chief engineer.

Discharge measurements of Turlock canal near La Grange, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height (a).	Gage height (b).	Discharge.	Date.	Made by—	Gage height (a).	Gage height (b).	Discharge.
		Feet.	*Feet.*	*Sec.-ft.*			*Feet.*	*Feet.*	*Sec.-ft.*
Apr. 11	Turlock irrigation district	.....	5.40	863	May 19	H. D. McGlashan.	7.58	.....	1,530
15	do	.....	6.70	1,350	19	do	6.42	.....	1,170
22	do	7.10	7.10	1,430	21	do	5.02	.....	824
May 6	do	7.26	7.15	1,500	22	do	2.73	.....	371
6	do	7.58	7.44	1,580	22	Turlock irrigation district	1.24	2.54	148

a Gage at measuring section. b Regular gage from which daily gage heights were read.

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ily discharge, in second-feet, of Turlock canal near La Grange, Cal., for the year ending Sept. 30, 1914.

Day.	Mar.	Apr.	May.	June.	Aug.	Sept.	Day.	Mar.	Apr.	May.	June.	Aug.	Sept.
1	.....	670	1,420	1,560	0	150	16	.....	1,310	1,560	760	550	75
2	.....	670	1,480	1,520	0	136	17	.....	1,280	1,560	1,200	500	75
3	.....	670	1,480	1,560	0	131	18	375	1,280	1,560	1,480	475	77
4	.....	264	1,520	1,560	0	128	19	375	1,340	1,350	1,480	450	78
5	.....	670	1,480	1,560	80	132	20	640	1,380	358	1,520	400	80
6	.....	670	1,480	1,480	640	117	21	655	1,450	340	1,480	350	121
7	.....	640	1,480	1,480	610	109	22	670	1,420	640	1,520	317	235
8	.....	158	1,480	1,560	0	101	23	670	0	1,560	1,480	264	174
9	.....	700	1,420	1,480	0	95	24	670	1,450	1,560	1,450	244	142
10	.....	790	1,420	1,380	0	103	25	655	1,450	1,520	1,520	226	114
11	.....	855	1,450	1,380	10	128	26	670	1,480	1,560	1,450	217	102
12	.....	890	1,450	328	328	128	27	670	1,450	1,520	0	199	102
13	.....	1,030	1,520	0	317	121	28	670	1,450	1,560	0	190	102
14	.....	1,170	1,560	0	0	102	29	655	1,450	1,560	0	182	108
15	.....	1,310	1,560	450	610	70	30	670	1,420	1,560	0	174	128
							31	670	.....	1,560	.....	158	.....

NOTE.—Canal dry during reconstruction up to Mar. 17, 1914. No water in canal Apr. 23, June 13, 14, June 27 to Aug. 4, Aug. 8, 9, 10, 14, 1914. No reading Mar. 27; discharge interpolated. Discharge May 19–22, 1914, when stage was regulated for purpose of securing rating, computed from weighted mean hourly discharges.

Monthly discharge of Turlock canal near La Grange, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	.....	.....	0	0	
November	.....	.....	0	0	
December	.....	.....	0	0	
January	.....	.....	0	0	
February	.....	.....	0	0	
March	670	0	281	17,300	A.
April	1,480	0	1,030	61,300	A.
May	1,560	340	1,400	86,100	A.
June	1,560	0	1,090	64,900	A.
July	.....	.....	0	0	
August	640	0	242	14,900	A.
September	235	70	115	6,840	A.
The year	1,560	0	347	251,000	

MIDDLE FORK OF STANISLAUS RIVER AT SAND BAR FLAT, NEAR AVERY, CAL.

LOCATION.—At Sierra & San Francisco Power Co.'s dam at Sand Bar Flat, about 3 miles below Bakers Crossing, 11 miles above junction with North Fork of Stanislaus River, and 11 miles southeast of Avery.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 1, 1905, to September 30, 1914.

GAGE.—Staff showing depth of water over crest of dam; also a staff in flume below dam.

DISCHARGE.—Flow over dam computed from formula developed by company. Current-meter measurements made in flume. Discharge as published represents combined flow of river over dam and discharge of flume.

EXTREMES OF DISCHARGE.—Maximum discharge recorded during year, 5,640 second-feet January 25; minimum discharge recorded, 57 second-feet December 3.

1905–1910 and 1912–1914: Maximum discharge recorded, 9,760 second-feet March 19, 1907; minimum discharge recorded, 50 second-feet November 22, 1905.

STORAGE.—Relief reservoir, on Relief Creek about 1 mile above mouth, has a capacity of 16,000 acre-feet.

COOPERATION.—Record of daily discharge furnished by Sierra & San Francisco Power Co., through H. F. Jackson, general manager.

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Daily discharge, in second-feet, of Middle Fork of Stanislaus River at Sand Bar Flat, near Avery, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	209	180	90	2,120	542	718	851	1,280	3,560	1,910	492	207
2	208	189	79	478	455	680	802	1,590	3,380	1,810	451	209
3	208	183	57	855	430	654	950	2,010	3,050	1,870	498	218
4	206	179	88	575	414	654	1,240	2,480	2,860	1,820	474	218
5	206	185	97	465	212	755	1,870	2,580	2,590	1,810	428	219
6	209	179	95	382	206	854	1,850	2,690	2,130	1,640	452	206
7	216	177	93	353	204	941	1,720	2,830	1,940	1,370	465	207
8	218	112	92	388	199	1,030	1,660	3,090	1,570	1,270	425	209
9	218	88	84	333	208	1,090	1,630	3,090	1,280	1,170	390	206
10	202	83	82	228	217	1,110	2,730	2,550	1,380	1,090	364	206
11	198	84	89	237	214	1,140	1,910	2,650	1,540	1,120	346	208
12	199	130	90	283	208	1,210	1,790	2,780	1,670	1,150	316	211
13	198	104	86	408	212	1,230	1,890	2,990	1,770	1,170	327	206
14	204	101	96	428	212	1,210	2,230	3,090	1,780	1,190	281	208
15	193	97	90	394	212	1,250	2,580	3,210	1,870	1,290	269	223
16	198	90	82	378	535	1,380	2,310	3,110	1,980	1,240	261	226
17	193	88	80	402	208	1,500	2,040	3,110	2,220	1,250	264	228
18	188	91	88	430	204	1,590	2,150	3,150	2,380	1,200	241	229
19	186	103	81	350	375	1,610	2,550	3,060	2,560	1,090	237	234
20	184	101	84	306	721	1,510	2,640	3,120	2,690	1,150	233	206
21	182	103	72	322	1,400	1,650	2,150	3,220	2,590	1,040	237	212
22	180	88	103	1,470	1,020	1,720	1,880	3,320	2,510	920	211	216
23	182	74	94	876	870	1,790	1,610	2,950	2,290	841	194	220
24	182	85	89	1,050	750	1,640	1,460	2,750	2,240	851	203	216
25	182	92	120	5,640	743	1,550	1,390	2,500	1,910	799	212	221
26	182	99	107	2,220	677	1,350	1,380	2,200	1,590	680	221	220
27	182	101	95	1,480	642	1,300	1,310	2,390	1,650	705	220	214
28	183	103	103	1,150	666	1,140	1,270	2,660	1,660	675	219	224
29	184	88	103	922	.....	1,010	1,160	2,890	1,930	614	204	222
30	184	100	122	766	.....	959	1,140	3,210	1,920	564	187	218
31	183	.....	176	666	.....	910	.....	3,490	.....	515	215	.....

Monthly discharge of Middle Fork of Stanislaus River at Sand Bar Flat, near Avery, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	218	180	195	12,000
November	189	74	116	6,900
December	176	57	93.8	5,770
January	5,640	228	850	52,300
February	1,400	199	463	25,700
March	1,790	654	1,200	73,800
April	2,730	802	1,740	104,000
May	3,490	1,280	2,780	171,000
June	3,560	1,280	2,150	128,000
July	1,910	515	1,160	71,300
August	498	187	308	18,900
September	234	206	216	12,900
The year	5,640	57	941	683,000

NOTE.—Monthly and yearly discharge computed by engineers of U. S. Geological Survey

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STANISLAUS RIVER AT KNIGHTS FERRY, CAL.

CATION.—In the NE. ¼ sec. 29, T. 1 S., R. 12 E., at Knights Ferry, about 25 miles below mouth of South Fork and 12 miles northeast of Oakdale.

TAINAGE AREA.—935 square miles.

CORDS AVAILABLE.—May 19, 1903, to September 30, 1914. From May 3, 1895, to February 16, 1901, a station was maintained one-half mile north of Oakdale.

AGE.—Staff on right bank in five sections—two vertical and three inclined. Original gage datum has been maintained although several changes have been made in the gage. Zero of gage is 157.53 feet above sea level, United States Geological Survey datum. Observer, E. J. Coop.

SCHARGE MEASUREMENTS.—Made from cable 50 feet above gage or by wading.

HANNEL AND CONTROL.—Small boulders and gravel; slightly shifting during high water.

XTREMES OF DISCHARGE.—Maximum stage recorded during year, 19.0 feet at 8.30 p. m. January 25 (discharge, 32,200 second-feet); minimum stage recorded, August 1 to September 30 (discharge, 4 second-feet).

1903–1914: Maximum stage recorded, 26.0 feet at 4 a. m. January 31, 1911 (discharge, 60,000 second-feet); channel dry December 3, 4, 5, 1912.

TORAGE AND DIVERSIONS.—Ditches diverting water for mining are numerous above the station. Water is also diverted from the South Fork into the Tuolumne basin and from the North Fork for use in the vicinity of Murphy and Angels. (See Utica Gold Mining Co.'s canal near Avery, p. 185.) The South San Joaquin canal [1] heads on the right bank and the Oakdale canal on the left bank at Goodwin dam, 4 miles above Knights Ferry (gaging stations are maintained on these canals near their intakes). Some power is occasionally developed at Knights Ferry above the station. The water diverted for power on Middle Fork at Sand Bar Flat near Avery is returned to the river several miles above this station. Storage is developed on Middle Fork (see Relief Creek near Baker Station), North Fork, and South Fork drainages.

ACCURACY.—Rating curves fairly well defined except for extremely high stages. Total natural flow at this point may be determined by combining discharge at the river gaging station with the discharge of South San Joaquin and Oakdale canals. Results are affected by many small diversions for irrigation and mining.

Discharge measurements of Stanislaus River at Knights Ferry, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Nov. 21	Lasley Lee...a.....	5.25	179	July 15	H. J. Tompkins.....	6.12	761
Feb. 8	Charles Leidl.....	6.78	1,170	Aug. 27	Charles Leidl.....	.....	a 4
Mar. 22	.....do.....	9.38	4,320				

a Estimated.

[1] This canal serves lands previously irrigated from Stanislaus and San Joaquin Water Co.'s canal (now abandoned) and furnishes water for domestic use at Knights Ferry, replacing Schell's ditch.

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Daily discharge, in second-feet, of Stanislaus River at Knights Ferry, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1	15	142	159	11,100	2,390	2,410	2,080	2,750	7,850	2,300
2	15	139	153	4,850	2,170	2,520	2,080	3,510	7,020	2,190
3	15	179	136	3,650	1,950	2,300	2,190	4,810	6,820	2,190
4	15	179	112	1,900	1,750	2,190	2,750	6,420	6,040	2,080
5	15	192	139	1,300	1,650	2,300	4,970	6,820	5,310	1,980
6	15	179	112	1,120	1,550	2,410	5,140	6,820	4,060	1,880
7	15	185	122	910	1,460	2,630	4,650	7,020	3,510	1,490
8	15	182	125	1,040	1,320	2,750	4,200	8,060	2,990	980
9	40	159	108	832	1,280	2,990	3,780	7,850	2,410	1,220
10	53	153	131	685	1,190	2,990	8,500	6,040	2,520	1,220
11	78	153	131	585	1,100	2,990	5,310	6,040	2,410	900
12	68	136	128	585	1,190	3,120	4,500	6,420	2,630	860
13	58	153	145	870	1,140	3,250	4,500	7,020	2,870	820
14	68	98	147	2,240	1,100	3,120	4,650	6,820	3,120	785
15	100	156	179	2,830	1,020	2,990	5,670	8,060	3,380	820
16	78	166	175	1,800	1,100	3,380	6,620	7,640	3,510	785
17	70	122	169	4,690	1,140	3,780	6,420	7,020	4,060	785
18	70	110	139	8,660	1,650	4,060	5,310	7,430	4,500	785
19	70	182	147	2,710	5,350	4,200	6,620	7,020	4,650	631
20	78	188	153	1,800	10,400	4,060	6,820	7,220	4,500	750
21	82	175	136	1,400	13,000	4,060	5,310	7,020	4,350	638
22	62	163	508	10,900	6,420	4,060	4,350	7,640	3,920	400
23	40	166	795	5,350	4,810	4,350	3,780	6,420	3,510	336
24	51	133	330	9,380	3,920	4,060	3,380	5,670	3,510	261
25	62	125	585	16,200	3,250	3,780	3,120	5,140	3,510	225
26	159	128	650	13,600	2,870	3,250	3,120	4,650	2,520	174
27	125	142	394	7,520	2,630	3,120	2,990	5,490	2,300	111
28	115	147	256	4,690	2,520	2,750	2,750	5,850	2,300	90
29	120	212	223	3,660	.....	2,520	2,620	6,040	2,410	177
30	112	185	394	2,870	.....	2,520	2,410	7,020	2,630	135
31	128	.....	1,600	2,630	.....	2,190	.....	7,430	.....	32

NOTE.—Daily discharge determined from rating curves applicable as follows: Oct. 1, 1913, to Jan. 25, 1914, well defined below 3,600 second-feet; Jan. 26 to Feb. 21, 1914, fairly well defined below 3,600 second-feet; Feb. 22 to July 31, 1914, fairly well defined below 6,000 second-feet. Discharge June 20 interpolated. No water flowing over Goodwin dam during August and September; most of the water passing the gage during this period was return water from irrigation canals above station.

Monthly discharge of Stanislaus River at Knights Ferry, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	159	15	64.7	3,980	B.
November	212	98	158	9,400	B.
December	1,600	108	280	17,200	B.
January	16,200	585	4,270	263,000	C.
February	13,000	1,020	2,900	161,000	C.
March	4,350	2,190	3,130	192,000	B.
April	8,500	2,080	4,350	259,000	B.
May	8,060	2,750	6,420	395,000	B.
June	7,850	2,300	3,840	228,000	B.
July	2,300	32	900	55,300	B.
August	.....	.....	*a* 4	246	D.
September	.....	.....	*a* 4	238	D.
The year	16,200	.....	2,190	1,580,000	

a Estimated.

RELIEF RESERVOIR NEAR BAKER STATION, CAL.

LOCATION.—In sec. 13, T. 5 N., R. 20 E., on Relief Creek, about 3 miles southeast of Baker Station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 1, 1910, to September 30, 1914.

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EXTREMES OF STORAGE.—Maximum storage recorded during year, 15,000 acre-feet August 18; maximum storage recorded 1912–1914, 15,200 acre-feet July 2 to 13 and 26 to 31, 1913; reservoir empty during parts of every year.

COOPERATION.—Daily storage in millions of cubic feet furnished by Sierra & San Francisco Power Co., through H. F. Jackson, general manager. It has been reduced to acre-feet by engineers of United States Geological Survey.

Storage, in acre-feet, in Relief reservoir near Baker Station, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	June.	July.	Aug.	Sept.	Day.	Oct.	Nov.	June.	July.	Aug.	Sept.
1	6,830	846	.....	11,400	14,200	14,800	16	3,610	.....	5,810	14,600	14,900	13,000
2	6,570	693	.....	11,700	14,100	14,700	17	3,360	.....	6,810	14,700	14,900	12,800
3	6,390	521	.....	11,800	14,100	14,700	18	3,190	.....	7,940	14,700	15,000	12,600
4	6,280	356	.....	11,900	14,200	14,600	19	3,000	.....	9,020	14,600	14,900	12,600
5	5,920	243	2,650	12,100	14,200	14,500	20	2,810	.....	9,910	14,500	14,900	12,600
6	5,550	109	2,470	12,100	14,300	14,400	21	2,630	.....	10,300	14,400	14,900	12,400
7	5,390	.....	2,340	12,500	14,300	14,300	22	2,470	.....	10,600	14,300	14,900	12,300
8	5,160	.....	2,230	13,000	14,300	14,200	23	2,280	.....	10,600	14,200	14,900	12,200
9	4,940	.....	2,540	13,300	14,300	14,100	24	2,090	.....	10,600	14,100	14,900	12,000
10	4,720	.....	2,580	13,600	14,400	13,900	25	1,930	.....	10,600	14,100	14,900	11,900
11	4,640	.....	2,590	14,000	14,600	13,800	26	1,760	.....	10,600	14,200	14,900	11,700
12	4,360	.....	3,110	14,300	14,700	13,600	27	1,620	.....	10,600	14,200	14,900	11,500
13	4,160	.....	3,390	14,500	14,700	13,600	28	1,460	.....	10,600	14,200	14,900	11,400
14	4,060	.....	4,240	14,500	14,800	13,300	29	1,280	.....	10,800	14,200	14,900	11,200
15	3,830	.....	5,000	14,600	14,900	13,200	30	1,140	.....	11,100	14,200	14,900	11,000
							31	996	.....	.....	14,200	14,800	.....

NOTE.—Reservoir empty Nov. 7–30.

RELIEF CREEK NEAR BAKER STATION, CAL.

LOCATION.—In NW. ¼ sec. 13, T. 5 N., R. 20 E., one-fourth mile below Relief reservoir of the Sierra & San Francisco Power Co., one-fourth mile above junction with East Fork, and about 3 miles southeast of Baker Station.

RECORDS AVAILABLE.—October, 1910, to September 30, 1914.

DRAINAGE AREA.—Not measured.

DISCHARGE.—Computed from gage-height record at weir, which gives combined flow over spillway and through outlet gates of dam.

EXTREMES OF DISCHARGE.—1912–1914: Maximum discharge recorded, 795 second-feet June 23, 1914 (record incomplete); creek dry April 9 to May 25 and June 24 to 28, 1913.

STORAGE.—See Relief reservoir.

COOPERATION.—Record of daily discharge furnished by Sierra & San Francisco Power Co., through H. F. Jackson, general manager.

Daily discharge, in second-feet, of Relief Creek near Baker Station, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	June.	July.	Aug.	Sept.	Day.	Oct.	Nov.	June.	July.	Aug.	Sept.
1	110	101	.....	270	115	47	16	101	.....	.....	275	45	109
2	115	101	.....	270	105	53	17	101	.....	.....	285	50	109
3	115	93	.....	310	100	64	18	101	.....	.....	275	52	109
4	115	89	.....	310	113	64	19	101	.....	36	270	61	91
5	115	86	.....	320	70	67	20	101	.....	295	290	60	40
6	121	84	.....	334	95	67	21	101	.....	415	285	40	78
7	121	4.9	.....	100	103	67	22	101	.....	420	235	11	88
8	121	4.9	.....	100	103	67	23	101	.....	795	220	14	88
9	115	1.4	.....	100	80	67	24	101	.....	365	215	38	88
10	101	.9	.....	100	40	77	25	101	.....	365	195	36	67
11	110	3.2	.....	105	53	77	26	101	.....	270	110	36	88
12	110	.....	.....	110	45	87	27	101	.....	270	142	33	98
13	110	.....	.....	170	48	87	28	101	.....	270	145	28	98
14	101	.....	.....	215	43	98	29	101	.....	270	140	28	108
15	101	.....	.....	260	40	109	30	101	.....	270	140	34	108
							31	101	.....	.....	120	38	.....

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Monthly discharge of Relief Creek near Baker Station, Cal., for the year ending Sept. 30, 1914.

Month	Discharge in second-feet.			Run-off, in acre-feet.
	Maximum.	Minimum.	Mean.	
October	121	101	106	6,520
November 1–11	101	.9	51.8	1,130
June 19–30	795	36	337	8,020
July	334	100	207	12,700
August	115	11	56.7	3,490
September	109	40	82.2	4,890

NOTE.—Monthly discharge computed by engineers of U. S. Geological Survey.

NORTH FORK OF STANISLAUS RIVER NEAR AVERY, CAL.

LOCATION.—In sec. 35, T. 5 N., R. 15 E., 700 feet above intake of Utica Gold Mining Co.'s canal, and about 5 miles northeast of Avery, in Stanislaus National Forest.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—July 14 to September 30, 1914.

GAGE.—Vertical staff in two sections on right bank. Observer, James Hunter.

DISCHARGE MEASUREMENTS.—Made from cable 35 feet below gage or by wading.

CHANNEL AND CONTROL.—Large boulders and gravel; appears permanent.

EXTREMES OF DISCHARGE.—Minimum stage recorded during year, 1.3 feet September 30 (discharge, 48 second-feet).

STORAGE.—A small amount of storage is developed on the headwaters of this stream above the station.

ACCURACY.—Rating curve well defined; discharge interpolated for days on which gage was not read; results good.

COOPERATION.—Station maintained in cooperation with United States Forest Service and Utica Gold Mining Co.

Discharge measurements of North Fork of Stanislaus River near Avery, Cal., during the year ending Sept. 30, 1914.

[Made by H. J. Tompkins.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
July 14	2.66	226
Sept. 15	1.45	58

Daily discharge, in second-feet, of North Fork of Stanislaus River near Avery, Cal., for the year ending Sept. 30, 1914.

Day.	July.	Aug.	Sept.	Day.	July.	Aug.	Sept.	Day.	July.	Aug.	Sept.
1	.....	54	a 54	11	.....	a 54	54	21	119	54	61
2	.....	54	a 54	12	.....	a 54	a 54	22	a 119	a 54	61
3	.....	54	54	13	.....	54	a 54	23	119	54	61
4	.....	54	a 54	14	224	a 54	54	24	a 102	54	54
5	.....	a 54	54	15	168	54	58	25	86	a 54	a 54
6	.....	54	54	16	a 168	a 54	54	26	86	54	54
7	.....	54	a 54	17	168	54	54	27	77	a 54	a 54
8	.....	54	54	18	a 158	54	a 58	28	69	a 54	54
9	.....	54	a 54	19	149	a 54	61	29	61	54	a 51
10	.....	54	54	20	a 134	54	a 61	30	a 58	a 54	48
								31	54	54	.....

a Interpolated.

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onthly discharge of North Fork of Stanislaus River near Avery, Cal., for the year ending Sept. 30, 1914.

Month.	Mean discharge in second-feet.	Run-off (total in acre-feet).	Accuracy.
ly 14–31	118	4,210	B.
ugust	54.0	3,320	B.
ptember	55.1	3,280	B.

UTICA GOLD MINING CO.'S CANAL NEAR AVERY, CAL.

OCATION.—In sec. 35, T. 5 N., R. 15 E., 150 feet below headworks on North Fork of Stanislaus River and about 5 miles northeast of Avery, in Stanislaus National Forest.

RECORDS AVAILABLE.—July 14 to September 30, 1914.

AGE.—Vertical staff fastened to right side of flume.

DISCHARGE MEASUREMENTS.—Made from foot plank just below gage.

EXTREMES OF STAGE.—Maximum stage recorded during period, 1.3 feet at various times; minimum stage recorded, 1.2 feet at various times.

ACCURACY.—Discharge measurements indicate that gage is too near intake for satisfactory results. Estimates of daily discharge not prepared.

COOPERATION.—Station maintained in cooperation with United States Forest Service and Utica Gold Mining Co.

Discharge measurements of Utica Gold Mining Co.'s canal near Avery, Cal., during the year ending Sept. 30, 1914.

[Made by H. J. Tompkins.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
July 14	1.15	66
Sept. 15	1.20	56

Daily gage height, in feet, of Utica Gold Mining Co.'s canal near Avery, Cal., for the year ending Sept. 30, 1914.

[James Hunter, observer.]

Day.	July.	Aug.	Sept.	Day.	July.	Aug.	Sept.	Day.	July.	Aug.	Sept.
1	.....	1.1	1.2	11	.....	1.2	.....	21	1.2	1.2	1.3
2	.....	1.1	.....	12	.....	.....	1.2	22	.....	.....	1.3
3	.....	1.1	1.2	13	.....	1.2	.....	23	1.2	1.2	1.3
4	.....	1.2	.....	14	1.15	.....	1.2	24	.....	1.2	1.2
5	.....	1.2	1.2	15	1.1	1.2	1.2	25	1.2	.....	.....
6	.....	.....	1.2	16	.....	.....	1.2	26	1.2	1.2	1.2
7	.....	1.2	.....	17	1.2	1.2	1.2	27	1.2	.....	.....
8	.....	1.2	1.2	18	.....	1.2	.....	28	.....	.....	.....
9	.....	1.2	.....	19	1.2	.....	1.3	29	1.2	1.2	1.2
0	.....	.....	1.2	20	.....	1.2	.....	30	1.2	.....	1.3
								31	.....	1.2	.....

SOUTH FORK OF STANISLAUS RIVER AT STRAWBERRY, CAL.[1]

OCATION.—In the SE. ¼ sec. 17, T. 4 N., R. 18 E., at Sonora-Bridgeport State highway bridge at Strawberry, 1½ miles below mouth of Herring Creek, and 15 miles northeast of Confidence.

RAINAGE AREA.—About 54 square miles.

ECORDS AVAILABLE.—October 20, 1911, to September 30, 1914.

AGE.—Vertical staff on left bank at bridge.

ISCHARGE MEASUREMENTS.—Made from bridge at gage or by wading.

HANNEL AND CONTROL.—Gravel and boulders; appears permanent.

[1] *Formerly described* as near Confidence.

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EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.4 feet May 31 (discharge, 1,400 second-feet); minimum stage recorded, 1.4 feet October 31 to November 11, November 15 to 17, and January 18 to 21 (discharge, 11 second-feet)

1911–1914: Maximum stage recorded, 5.4 feet May 31, 1914 (discharge, 1,400 second-feet); minimum stage recorded, 1.15 feet November 2, 3, 1912 (discharge, 3 second-feet).

WINTER FLOW.—Stage-discharge relation probably affected by ice.

STORAGE.—Three storage reservoirs have been constructed above the station to supply Tuolumne and Sonora with water for domestic use. This water is diverted about 10 miles below the station. Flow is partially regulated by storage.

ACCURACY.—Gage readings September 1 to 30, 1914, from temporary gage used while bridge was being rebuilt. Mean discharge for month estimated by company. Rating curve fairly well defined; results good.

COOPERATION.—Station maintained in cooperation with Sierra & San Francisco Power Co., through H. F. Jackson, general manager.

Discharge measurements of South Fork of Stanislaus River at Strawberry, Cal., during the year ending Sept. 30, 1914.

[Made by Sierra & San Francisco Power Co.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Mar. 1	2.40	144
23	2.75	219

Daily discharge, in second-feet, of South Fork of Stanislaus River at Strawberry, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	.....	11	32	224	69	83	126	166.	1,180	625	99
2	.....	11	34	145	66	76	116	238	1,070	580	99
3	72	11	34	108	56	72	135	295	920	625	91
4	76	11	34	62	56	83	155	415	1,070	558	83
5	72	11	34	59	56	91	251	495	770	475	116
6	69	11	34	56	56	99	266	670	580	475	44
7	69	11	34	56	56	116	280	920	475	435	44
8	69	11	34	56	56	135	251	920	362	398	44
9	69	11	34	56	56	135	280	920	362	345	39
10	69	11	34	56	56	135	380	648	362	295	30
11	69	11	34	56	56	135	362	580	398	280	25
12	66	25	34	16	56	145	328	670	515	200	25
13	62	19	34	25	56	188	310	870	435	145	25
14	62	17	39	44	56	145	295	1,070	970	145	25
15	62	11	44	44	56	135	280	970	870	145	25
16	62	11	44	44	56	155	398	870	970	155	25
17	56	11	44	17	56	155	380	820	1,340	155	25
18	56	12	44	11	69	188	380	1,020	1,180	155	25
19	54	14	44	11	59	200	455	920	1,120	166	34
20	44	17	44	11	108	238	455	1,070	1,070	177	34
21	44	25	44	11	108	200	415	1,070	970	166	34
22	39	25	46	99	131	224	380	1,070	870	166	39
23	39	25	50	83	99	224	328	770	820	145	44
24	36	25	50	69	80	224	280	648	870	135	44
25	27	25	62	280	69	200	251	580	720	135	44
26	25	25	62	266	69	188	200	455	602	135	44
27	21	32	59	135	69	188	155	495	580	135	44
28	17	34	56	126	76	155	155	720	648	126	44
29	17	34	56	*69	.....	155	155	1,020	770	116	44
30	14	32	59	69	.....	135	155	1,280	870	116	44
31	11	.....	155	69	.....	126	.....	1,400	.....	108	44

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge Nov. 6–10, 1913, interpolated; Aug. 31, 1914, estimated.

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Monthly discharge of South Fork of Stanislaus River at Strawberry, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October 3–31	76	11	49.9	2,870
November	34	11	18.0	1,070
December	155	32	46.5	2,860
January	280	11	78.5	4,830
February	131	56	68.3	3,790
March	238	72	153	9,410
April	455	116	279	16,600
May	1,400	166	776	47,700
June	1,340	362	791	47,100
July	625	108	259	15,900
August	116	25	46.0	2,830
September	.....	.....	[a] 32	1,900
The year	1,400	11	217	157,000

[a] Estimated.

SOUTH SAN JOAQUIN CANAL[1] NEAR KNIGHTS FERRY, CAL.

LOCATION.—At footbridge three-fourths mile below headgate at Goodwin dam, 4 miles above Knights Ferry.

RECORDS AVAILABLE.—May 1 to September 30, 1914. Also miscellaneous measurements and approximate estimates for 1913.

GAGE.—Inclined staff on right bank fastened to the concrete lining. Observer, Griffin Morrison.

DISCHARGE MEASUREMENTS.—Made from footbridge at gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during period, 7.6 feet June 27 (discharge, 687 second-feet); minimum stage recorded, 2.0 feet May 1 (discharge, 56 second-feet).

ACCURACY.—Rating curve well defined; results excellent.

COOPERATION.—Station maintained in cooperation with South San Joaquin irrigation district, through A. Griffin, chief engineer.

Discharge measurements of South San Joaquin canal near Knights Ferry, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Nov. 21	Lasley Lee	.....	Dry.	Aug. 27	Charles Leidl	2.51	99
July 16	H. J. Tompkins	7.20	635	27	.....do	1.83	44
Aug. 27	Charles Leidl	3.02	148	27	.....do	1.32	19

Daily discharge, in second-feet, of South San Joaquin canal near Knights Ferry, Cal., for the year ending Sept. 30, 1914.

Day.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept.
1	56	92	661	557	152	16	225	557	635	247	162
2	97	97	661	531	152	17	225	570	635	225	162
3	142	97	661	409	152	18	247	570	609	203	162
4	142	97	661	457	152	19	291	570	583	225	162
5	142	97	661	457	162	20	361	583	583	225	162
6	142	133	648	409	162	21	409	661	583	214	172
7	142	214	648	409	152	22	409	674	583	182	182
8	142	291	648	397	142	23	409	661	583	182	172
9	142	280	648	361	152	24	409	674	583	142	172
10	142	142	325	313	162	25	409	674	570	142	172
11	142	361	583	313	152	26	409	674	570	142	162
12	182	505	583	313	162	27	409	687	570	152	162
13	225	505	583	302	162	28	409	674	557	162	162
14	225	518	622	291	162	29	457	661	557	152	179
15	225	518	635	269	162	30	505	661	557	152	162
						31	505	.....	557	152	.....

NOTE.—Discharge determined from a well-defined rating curve.

[1] Also known as "Main Supply canal."

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Monthly discharge of South San Joaquin canal near Knights Ferry, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May	505	56	270	16,600	A.
June	687	92	450	26,800	A.
July	661	325	598	36,800	A.
August	557	142	280	17,200	A.
September	182	142	161	9,580	A.
The period				107,000	

OAKDALE CANAL[1] NEAR KNIGHTS FERRY, CAL.

LOCATION.—At footbridge 2,300 feet below headgate at Goodwin dam, 4 miles above Knights Ferry.

RECORDS AVAILABLE.—May 3 to September 30, 1914. Also miscellaneous measurements and approximate estimates for 1913.

GAGE.—Inclined staff fastened to concrete lining on right bank. Observer, E. C. Pearson.

DISCHARGE MEASUREMENTS.—Made from footbridge at gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.8 feet June 18 to 20 (discharge, 148 second-feet); canal dry June 21 to 26.

ACCURACY.—Rating curve well defined; results excellent.

COOPERATION.—Station in cooperation with Oakdale irrigation district, through Burton Smith, chief engineer.

Discharge measurements of Oakdale canal near Knights Ferry, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Nov. 21	Lasley Lee		Dry.	Aug. 27	Charles Leidl	1.70	28
July 16	H. J. Tompkins	3.62	134	27	do	1.10	11
Aug. 27	Charles Leidl	2.51	61				

Daily discharge, in second-feet, of Oakdale canal near Knights Ferry, Cal., for the year ending Sept. 30, 1914.

Day.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept.
1		132	111	132	58	16	104	140	132	104	64
2		132	118	132	61	17	104	140	132	72	66
3	84	132	118	132	61	18	104	148	132	104	66
4	90	132	118	104	61	19	104	148	132	104	66
5	97	132	118	118	61	20	104	148	132	97	72
6	97	132	118	132	61	21	111	0	132	90	72
7	104	132	118	132	61	22	111	0	132	75	72
8	104	132	118	132	61	23	111	0	132	78	72
9	104	132	118	132	58	24	111	0	132	51	66
10	104	132	132	118	58	25	111	0	132	84	66
11	104	132	132	118	61	26	118	0	125	64	66
12	104	132	132	118	61	27	118	1	132	61	69
13	104	132	132	118	64	28	125	14	125	66	69
14	104	140	132	111	61	29	132	24	132	61	69
15	104	140	132	118	61	30	132	72	132	64	66
						31	132		132	61	

NOTE.—Discharge determined from a well-defined rating curve.

[1] Also known as "South Main canal."

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Monthly discharge of Oakdale canal near Knights Ferry, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
May (29 days)	132	84	108	6,210	A.
June	148	0	94.4	5,620	A.
July	132	111	127	7,810	A.
August	132	61	99.5	6,120	A.
September	72	58	64.3	3,830	A.
The period				29,600	

CALAVERAS RIVER AT JENNY LIND, CAL.

LOCATION.—In the SE. ¼ sec. 22, T. 3 N., R. 10 E., at highway bridge on Milton road, about one-fourth mile southeast of Jenny Lind, and 27 miles above junction with San Joaquin River. North and South forks unite about 15 miles above the station.

DRAINAGE AREA.—395 square miles.

RECORDS AVAILABLE.—January 1 to June 30, 1907; December 1, 1907, to June 30, 1908; and November 1, 1908, to September 30, 1914.

GAGE.—Vertical staff in two sections, high-water section is on downstream end of middle pier of bridge; low-water section is underneath bridge on right bank. Observer, P. F. Sinclair.

DISCHARGE MEASUREMENTS.—Made from bridge at gage or by wading.

CHANNEL AND CONTROL.—Gravel and small boulders; shifts considerably during high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 6.2 feet January 22 (discharge, 14,200 second-feet); channel dry October 1 to November 17.

1907–1914: Maximum stage recorded, 14.0 feet January 31, 1911 (discharge, 69,600 second-feet); channel dry July 22 to November 17, 1913.

STORAGE.—A little storage is developed at Salt Springs Valley for use in connection with dredging operations below Jenny Lind.

ACCURACY.—Results only fair on account of changes in channel and uncertainties at times in the gage-height record.

COOPERATION.—Gage-height record during high-water season December to June. furnished by the United States Weather Bureau, through N. R. Taylor, local forecaster.

Discharge measurements of Calaveras River at Jenny Lind, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Feb. 10	Charles Leidl	0.32	198	Mar. 20	Charles Leidl	.15	187
22	R. C. Rice	3.21	4,030	June 18	.....do	−.60	28
26	.....do	1.22	871	Aug. 29	.....do	−1.12	.6

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Daily discharge, in second-feet, of Calaveras River at Jenny Lind, Cal., for the year ending Sept. 30, 1914.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1	.....	17	9,640	190	600	140	115	54	22
2	.....	17	1,120	440	600	140	115	52	22
3	.....	17	1,330	440	600	140	115	50	21
4	.....	17	920	380	530	140	115	49	21
5	.....	17	830	325	530	340	90	48	20
6	.....	12	215	325	460	290	90	46	20
7	.....	12	142	275	340	240	90	44	20
8	.....	12	142	275	340	200	90	43	20
9	.....	12	258	230	340	200	90	42	20
10	.....	12	176	230	290	200	90	40	20
11	.....	12	142	230	290	170	90	38	20
12	.....	12	142	190	290	170	70	37	20
13	.....	17	176	190	290	170	70	36	16
14	.....	27	830	190	290	170	70	34	12
15	.....	27	2,120	155	290	170	70	32	10
16	.....	42	830	155	240	140	70	31	7
17	.....	42	665	155	200	140	70	30	5
18	17	42	9,200	190	200	140	55	28	3
19	17	42	1,840	8,110	200	140	55	28	3
20	17	215	920	5,990	200	140	55	27	3
21	17	42	745	13,200	170	115	55	27	3
22	17	62	14,200	4,230	170	115	55	27	3
23	17	62	3,240	1,140	170	115	55	26	2
24	17	258	6,650	1,750	170	115	55	26	1
25	17	305	4,370	1,490	170	115	55	25	2
26	17	595	6,310	940	170	115	55	25	2
27	17	215	2,470	680	170	115	55	24	2
28	17	111	1,550	680	140	115	55	24	.5
29	17	111	1,100	.....	140	115	55	23	.5
30	17	176	325	.....	140	115	55	23	.5
31	.....	1,980	190	.....	140	.....	55	.....	.5

NOTE.—Channel practically dry Oct. 1 to Nov. 17, 1913. Discharge determined as follows: Nov. 18 to Feb. 21, 1914, from 2 poorly defined rating curves; Feb. 22 to Sept. 30 from a fairly well defined rating curve; gage heights June 1 to July 4, 1914 unreliable; discharge estimated by means of measurement made June 18. Mean monthly flow for August and September estimated at 0.5 second-foot from 1 discharge measurement and observer's report.

Monthly discharge of Calaveras River at Jenny Lind, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 395 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	0	0.1	0.0	0.000	0.00	0	
November	17	.0	7.4	.019	.02	440	D.
December	1,980	12	146	.367	.42	8,980	C.
January	14,200	142	2,350	5.95	6.86	144,000	C.
February	13,200	155	1,530	3.87	4.03	85,000	C.
March	600	140	286	.724	.83	17,600	B.
April	340	115	158	.400	.45	9,430	B.
May	115	55	73.5	.187	.22	4,520	B.
June	54	23	34.6	.085	.09	2,060	C.
July	22	.5	10.4	.026	.03	640	C.
August	.....	.....	*a*.5	.001	.00	31	
September	.....	.....	*a*.5	.001	.00	30	
The year	14,200	0	377	.954	12.95	273,000	

a Estimated.

MOKELUMNE RIVER NEAR CLEMENTS, CAL.

LOCATION.—In the NW. ¼ sec. 15, T. 4 N., R. 8 E., at highway bridge, about 1 mile north of Clements. North and Middle forks unite about 35 miles above Clements, and Cosumnes River enters about 19½ miles below.

DRAINAGE AREA.—642 square miles.

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RECORDS AVAILABLE.—October 28, 1904, to September 30, 1914.

GAGE.—Staff in four sections at bridge; No. 1, vertical, is fastened to pile on right bank; No. 2, inclined, is directly back of No. 1; No. 3, vertical, is bolted to middle pier near downstream end; No. 4, vertical, is bolted to left abutment near downstream end. Observer, Mrs. J. S. Hodges.

DISCHARGE MEASUREMENTS.—Made from bridge at gage or by wading.

CHANNEL AND CONTROL.—Sand and gravel; somewhat shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 15.5 feet at 7.30 a. m. January 26 (discharge, 13,300 second-feet); minimum stage recorded, 2.95 feet October 27 (discharge, 82 second-feet).

1904–1914: Maximum stage recorded, 17.45 feet January 30, 1911 (discharge, 16,700 second-feet); minimum stage recorded, 2.5 feet October 3 to 5, 1912 (discharge, 23 second-feet).

DIVERSIONS.—Several small ditches divert water for mining and local irrigation above the station. Power is developed on the North Fork and part of the water is not returned to the stream. Flow partly regulated by storage.

ACCURACY.—Rating curve fairly well defined; results good.

Discharge measurements of Mokelumne River near Clements, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 14	Charles Leidl	3.35	146	Feb. 27	R. C. Rice	6.45	1,780
Feb. 9	....do	5.22	949	June 17	Charles Leidl	9.08	4,140
21	R. C. Rice	13.80	9,800	Aug. 28	....do	3.48	167

Daily discharge, in second-feet, of Mokelumne River near Clements, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	111	152	130	9,250	1,600	1,600	1,080	1,400	5,830	2,120	205	155
2	120	130	140	3,070	1,400	1,600	1,020	1,810	6,220	1,810	192	155
3	102	95	152	2,280	1,330	1,400	1,140	2,620	5,340	1,810	125	145
4	120	140	152	1,400	1,140	1,400	1,600	3,540	4,400	1,660	192	145
5	130	140	176	1,030	1,080	1,260	2,620	3,950	3,740	1,400	180	145
6	102	102	163	705	1,080	1,400	2,620	3,840	2,620	1,400	192	145
7	120	120	152	605	1,020	1,460	2,440	4,170	2,280	1,260	192	115
8	120	130	130	920	915	1,520	2,200	5,340	1,960	1,260	192	125
9	130	111	130	730	970	1,660	1,960	5,100	1,810	1,140	180	155
10	111	102	140	630	915	1,660	5,580	3,740	2,120	1,020	108	145
11	130	120	140	560	915	1,600	3,160	3,340	2,280	915	155	145
12	130	130	130	494	805	1,660	2,620	3,950	2,980	805	180	135
13	95	163	163	538	860	1,660	2,440	4,620	3,070	805	180	135
14	120	163	152	1,740	805	1,660	2,890	4,170	3,070	778	168	92
15	120	140	140	1,520	805	1,660	3,540	5,340	3,740	750	168	125
16	111	152	176	1,260	860	1,740	3,740	5,220	4,400	750	180	125
17	130	102	163	1,330	860	1,960	2,800	4,400	4,620	675	92	115
18	120	140	163	4,280	970	2,120	2,800	4,980	4,400	650	155	125
19	140	140	163	2,120	2,620	2,200	3,740	4,740	4,280	550	155	115
20	102	176	176	1,260	2,800	2,120	3,950	5,100	4,400	482	168	145
21	120	152	163	1,140	9,850	2,120	2,980	4,860	4,170	505	155	135
22	140	152	220	7,470	4,400	2,120	2,440	6,090	3,340	438	168	115
23	120	152	390	3,950	3,160	2,280	2,120	4,740	2,710	375	155	125
24	88	130	282	4,170	2,620	2,120	1,880	3,740	2,440	318	108	125
25	130	130	352	5,960	2,200	1,960	1,600	3,160	3,340	300	155	115
26	120	111	516	11,100	1,960	1,740	1,660	2,980	2,440	282	180	135
27	82	140	317	5,580	1,740	1,660	1,600	3,160	1,960	180	180	115
28	111	130	266	3,540	1,600	1,460	1,520	4,860	1,810	235	192	92
29	111	176	190	2,710	.....	1,330	1,400	4,860	1,960	235	192	145
30	111	152	250	2,120	.....	1,260	1,330	5,830	2,120	235	192	135
31	111	.....	1,260	1,810	.....	1,200	.....	5,830	.....	168	115	.....

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Monthly discharge of Mokelumne River near Clements, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	140	82	116	7,130	B.
November	176	95	136	8,090	B.
December	1,260	130	233	14,300	B.
January	11,100	494	2,750	169,000	B.
February	9,850	805	1,830	102,000	B.
March	2,280	1,200	1,700	105,000	B.
April	5,580	1,020	2,420	144,000	B.
May	6,090	1,400	4,240	261,000	B.
June	6,220	1,810	3,330	198,000	B.
July	2,120	168	816	50,200	B.
August	205	92	166	10,200	B.
September	155	92	131	7,800	B.
The year	11,100	82	1,490	1,080,000	

MIDDLE FORK OF MOKELUMNE RIVER AT WEST POINT, CAL.

LOCATION.—In sec. 10, T. 6 N., R. 13 E., above highway bridge, 3½ miles above junction with the South Fork, 1¼ miles below mouth of Bear Creek, and 1 mile south of West Point.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 9, 1911, to September 30, 1914.

GAGE.—Vertical staff in two sections, fastened to trees on right bank, 1,000 feet above bridge. Observers, Russell Bardsley and C. H. Spink.

DISCHARGE MEASUREMENTS.—Made from cable one-half mile above gage or by wading.

CHANNEL AND CONTROL.—Boulders and gravel; apparently permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.0 feet January 23 (discharge, 2,550 second-feet); minimum stage recorded, 2.5 feet October 3 and 4 (discharge, 3 second-feet).

1911–1914: Maximum stage recorded, 10.0 feet January 23, 1914 (discharge, 2,550 second-feet); minimum stage recorded, 2.48 feet August 15, 1913 (discharge, 2.8 second-feet).

DIVERSIONS.—Mokelumne Hill and Valley Springs ditch (capacity about 6 second-feet) diverts about 2 miles above the station.

ACCURACY.—Rating curve well defined except at extremely high stages; results good.

Discharge measurements of Middle Fork of Mokelumne River at West Point, Cal., during the year ending Sept. 30, 1914.

[Made by R. C. Rice.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Feb. 23	5.85	[a] 464
23	5.85	[a] 481
25	5.39	[b] 339

[a] One second-feet, estimated inflow between measuring section at cable and gage, has been added.
[b] One-half second-foot, estimated inflow between measuring section at cable and gage, has been added.

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discharge, in second-feet, of Middle Fork of Mokelumne River at West Point, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	4	6	8	250	190	230	190	132	74	22	6	5
.....	4	6	8	1,340	155	230	190	125	64	20	6	5
.....	3	6	8	755	148	220	180	125	60	20	6	5
.....	3	6	6	315	155	230	190	118	55	20	6	5
.....	4	6	6	755	148	220	190	125	55	18	6	6
.....	4	8	6	250	140	210	200	132	55	18	6	6
.....	4	9	6	170	140	210	210	132	74	16	6	5
.....	4	8	7	85	140	200	250	140	60	16	5	5
.....	4	8	8	80	132	200	280	140	50	16	5	5
.....	4	7	8	64	125	190	250	125	50	16	5	5
.....	4	6	8	64	118	180	230	111	46	16	5	5
.....	4	8	8	85	111	190	220	118	46	16	5	5
.....	4	9	6	155	97	180	210	111	42	14	5	5
.....	4	11	7	270	85	170	210	118	38	12	5	5
.....	4	12	8	610	74	170	200	104	38	12	4	5
.....	4	10	8	875	85	162	200	104	38	12	4	5
.....	4	9	8	1,400	91	155	190	97	38	10	4	5
.....	4	8	9	1,200	155	155	180	91	34	10	5	5
.....	5	9	8	610	290	162	170	97	34	9	5	5
.....	5	9	9	250	645	170	162	111	34	9	5	5
.....	5	8	9	875	1,010	170	155	118	31	9	5	5
.....	4	8	12	1,400	680	170	148	125	28	9	5	5
.....	5	9	11	2,550	425	180	140	155	25	9	5	5
.....	5	8	12	1,510	365	190	140	190	38	6	5	5
.....	5	8	85	1,100	315	190	132	125	31	6	5	6
.....	5	7	55	515	280	190	140	97	28	6	5	6
.....	5	6	31	395	260	180	132	97	28	6	5	6
.....	4	8	20	515	230	180	125	85	25	6	5	6
.....	5	8	29	365	.....	170	132	80	25	6	5	6
.....	5	9	31	230	.....	180	125	74	22	6	5	6
.....	5	.....	74	250	.....	190	.....	74	.....	6	5	.....

hly discharge of Middle Fork of Mokelumne River at West Point, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
r.....	5	3	4.3	264	B.
ıber.....	12	6	8.0	476	B.
ber.....	85	6	16.5	1,010	B.
y.....	2,550	64	622	38,200	B.
ary.....	1,010	74	242	13,400	A.
.....	230	155	188	11,600	A.
.....	280	125	182	10,800	A.
.....	140	74	115	7,070	A.
.....	74	22	42.2	2,510	A.
.....	22	6	12.2	750	B.
t.....	6	4	5.1	314	B.
ıber.....	6	5	5.3	315	B.
The year.....	2,550	3	120	86,700	

SOUTH FORK OF MOKELUMNE RIVER NEAR RAILROAD FLAT, CAL.

TION.—In sec. 34, T. 6 N., R. 14 E., at Laidet ranch, about 5 miles above mouth f Licking Fork, and 5 miles east of Railroad Flat.

NAGE AREA.—Not measured.

RDS AVAILABLE.—October 23, 1911, to September 30, 1914.

E.—Vertical staff fastened to alder tree on right bank 100 feet above suspension ootbridge. Observer, Clovis Laidet.

HARGE MEASUREMENTS.—Made from cable 150 feet below gage or by wading.

NNEL AND CONTROL.—Gravel; appears permanent.

REMES OF DISCHARGE.—Maximum stage recorded during year, 6.9 feet at 4.20 p. m. January 25 (discharge, 3,330 second-feet); minimum stage recorded, 1.04 feet October 1 to 3, 17, and 19 to 21 (discharge, 4.5 second-feet).

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1911–1914: Maximum stage recorded, 6.9 feet at 4.20 p. m. January 25, 1914 (discharge, 3,330 second-feet); minimum stage recorded, 1.10 feet November 18, 1911 (discharge, 4 second-feet).

DIVERSIONS.—An irrigation and power ditch (capacity about 2 second-feet) diverts water at base of Blue Mountain, above the station. Some water is also used for irrigation at Laidet ranch.

WINTER FLOW.—Stage-discharge relation at times slightly affected by ice.

ACCURACY.—Rating curve well defined except at extremely high water, and results are good.

The following discharge measurement was made by R. C. Rice:

February 24, 1914: Gage height, 2.95 feet; discharge, 380 second-feet.

Daily discharge, in second-feet, of South Fork of Mokelumne River near Railroad Flat, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.5	5	8	550	175	222	105	105	50	28	11	7
2	4.5	6.5	8	258	150	190	105	98	47	24	10	7
3	4.5	5.5	7.5	125	125	175	105	98	44	20	10	7
4	5	7	6.5	83	125	162	150	98	41	18	10	6.5
5	5	6.5	6.5	66	115	162	175	98	39	18	9.5	6.5
6	5	6	6.5	57	105	175	175	98	36	18	9	6.5
7	5	5.5	6	53	98	175	162	98	66	18	9.5	7.5
8	5	5	6	63	90	175	162	98	50	18	13	7.5
9	5	5	6.5	58	89	175	205	98	47	18	13	6.5
10	5	5	6.5	56	84	190	295	90	44	18	12	6.5
11	5	7.5	6.5	46	82	190	275	90	44	17	12	6.5
12	5	12	6.5	49	76	190	205	89	41	17	11	7
13	5	18	17	105	73	190	205	86	36	17	11	7
14	5	15	10	162	76	175	205	82	36	17	10	6.5
15	5	9	8	162	76	175	205	82	34	16	9.5	6.5
16	5	6	8	150	76	190	190	75	34	16	9	6.5
17	4.5	6.5	8	190	82	205	162	71	31	15	8.5	7
18	5	7.5	7.5	450	115	205	150	68	29	14	8	7.5
19	4.5	13	7.5	148	258	205	162	66	29	13	7.5	7.5
20	4.5	12	7.5	105	825	205	150	64	29	13	7	6.5
21	4.5	8.5	8	125	1,240	205	150	62	28	13	7	6.5
22	5	8	30	945	655	190	150	58	26	12	7	7
23	5	7	18	405	475	205	150	53	25	12	7.5	6.5
24	5	7	15	682	405	190	125	61	24	12	7	6.5
25	5	8	51	2,000	338	175	105	98	25	12	7	7
26	5	7.5	26	1,140	275	162	105	68	25	12	7	7.5
27	5	23	18	575	258	150	105	62	25	12	6.5	7
28	5	17	14	428	240	138	105	58	23	11	6.5	7
29	5	9	13	315	.....	138	105	56	23	10	6.5	7
30	5	8	27	258	.....	125	105	51	21	10	6.5	6.5
31	5	.....	258	205	.....	115	.....	50	.....	11	6.5	.....

NOTE.—Discharge determined from a rating curve well defined below 600 second-feet. Discharge interpolated Aug. 12–19, 1914.

Monthly discharge of South Fork of Mokelumne River near Railroad Flat, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	5	4.5	4.89	301	B.
November	23	5	8.88	528	B.
December	258	6	20.4	1,250	B.
January	2,000	46	323	19,900	B.
February	1,240	73	242	13,400	A.
March	222	115	178	10,900	A.
April	295	105	158	9,400	A.
May	105	50	78.4	4,820	A.
June	50	21	35.1	2,090	A.
July	28	10	15.5	953	B.
August	13	6.5	8.89	547	B.
September	7	6.5	6.85	408	B.
The year	2,000	4.5	89.2	64,500	

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LICKING FORK OF MOKELUMNE RIVER NEAR RAILROAD FLAT, CAL.

LOCATION.—In the E. ½ SE. ¼ sec. 26, T. 6 N., R. 14 E., at Mokelumne forest ranger station, 100 feet above mouth of Big Canyon Creek, and 6½ miles east of Railroad Flat. Licking Fork joins the South Fork 6 miles below the station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 23, 1911, to September 30, 1914.

GAGE.—Vertical staff on left bank 300 feet above ranger station.

DISCHARGE MEASUREMENTS.—Made from foot log near gage or by wading.

CHANNEL AND CONTROL.—Boulders and gravel, rough; shifts during high water.

EXTREMES OF STAGE.—1911–1914: Maximum stage recorded, 2.4 feet January 25, 1914; minimum stage recorded, 0.25 foot June 1 to 10, 1914.[1]

DIVERSIONS.—An irrigation ditch of 1 second-foot capacity heads above the station.

ACCURACY.—Rating curve fairly well defined; results fair for periods covered by gage heights to January 22, 1914. Estimates not prepared after this date owing to changes in channel caused by high water.

COOPERATION.—Station maintained in cooperation with United States Forest Service. No discharge measurements made during year.

Daily gage height, in feet, of Licking Fork of Mokelumne River near Railroad Flat, Cal., for the year ending Sept. 30, 1914.

[J. E. Elliott, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	0.42	.....	0.55	1.30	0.65	0.80	0.60	0.50	0.25
2	.42	.....	.55	.90	.65	.81	.60	.50	.25
3	.42	.....	.55	.90	.65	.81	.60	.50	.25
4	.44	.....	.55	.....	.63	.81	.....	.50	.25
5	.44	.....	.....	.80	.62	.80	.....	.50	.25
6	.44	.....	.....	.74	.59	.80	.....	.....	.....
7	.46	.....	.....	.71	.59	.80	.....	.....	.....
8	.46	.....	.....	.80	.55	.80	.....	.....	.....
9	.46	.....	.....	.....	.54	.80	.55	.....	.25
10	.46	.....	.....	.69	.51	.80	.90	.....	.25
11	.46	.....	.....	.69	.50	.80	.....	.....	.....
12	.46	.....	.....	.....	.47	.80	.....	.....	.....
13	.....	.....	.....	.80	.46	.80	.....	.....	.....
14	.....	.....	.....	.98	.46	.80	.....	.....	.....
15	.....	.....	.....	.98	.46	.80	.....	.....	.....
16	.....	.....	.....	.98	.46	.80	.....	.30	.....
17	.....	.....	.....	.98	.47	.79	.....	.30	.....
18	.....	.....	.....	1.10	.60	.79	.....	.30	.....
19	.....	.....	.....	1.00	.95	.79	.....	.30	.....
20	.....	0.55	.....	.90	1.32	.79	.....	.30	.....
21	.....	.45	.....	.....	1.70	.79	.....	.30	.....
22	.....	.45	.....	1.40	.....	.....	.....	.30	.....
23	.....	.45	.....	1.12	.....	.....	.....	.....	.....
24	.45	.45	.....	1.12	.....	.....	.....	.....	.....
25	.....	.50	.....	2.40	.....	.....	.....	.....	.....
26	.....	.52	.....	1.40	.....	.....	.50	.....	.....
27	.....	.72	.....	1.00	.....	.....	.50	.....	.....
28	.....	.60	.....	.95	.....	.....	.50	.....	.....
29	.....	.55	.....	.....	.....	.....	.50	.....	.....
30	.....	.55	.....	.80	.....	.65	.50	.....	.....
31	.....	.....	.....	.....	.....	.65	.....	.....	.....

[1] Record incomplete.

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Daily discharge, in second-feet, of Licking Fork of Mokelumne River near Railroad Flat, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Day.	Oct.	Nov.	Dec.	Jan.
1	0.8	.....	2	25	16	.....	.....	.....	12
2	.8	.....	2	10	17	.....	.....	.....	12
3	.8	.....	2	10	18	.....	.....	.....	16
4	.9	.....	2	8.5	19	.....	.....	.....	12
5	.9	.....	.....	7	20	.....	.2	.....	10
6	.9	.....	.....	5.5	21	.....	1	.....	.....
7	1	.....	.....	5	22	.....	1	.....	20
8	1	.....	.....	7	23	.....	1	.....	.....
9	1	.....	.....	6	24	1	1	.....	.....
10	1	.....	.....	4.5	25	.....	1.5	.....	.....
11	1	.....	.....	4.5	26	.....	1.5	.....	.....
12	1	.....	.....	4.5	27	.....	5	.....	.....
13	.....	.....	.....	7	28	.....	3	.....	.....
14	.....	.....	.....	12	29	.....	2	.....	.....
15	.....	.....	.....	12	30	.....	2	.....	.....
					31	.....	.....	.....	.....

NOTE.—No record; discharge interpolated Jan. 4, 9, and 12.

NORTH FORK OF COSUMNES RIVER NEAR EL DORADO, CAL.

LOCATION.—In sec. 23, T. 9 N., R. 10 E., at suspension footbridge at Celio's ranch,[1] 5 miles south of El Dorado, and 4 miles above junction with Middle Fork. Martines Creek enters about 1½ miles above station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 13, 1911, to September 30, 1914.

GAGE.—Staff in three sections on right bank at the bridge. Observer, James Yates.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Gravel and solid rock; apparently permanent.

EXTREMES OF DISCHARGE.—1911–1914: Maximum stage recorded, 14.2 feet January 25, 1914 (discharge, 6,930 second-feet); minimum stage recorded, 2.85 feet August 19 to September 9 and September 14 to 17, 1914 (discharge, 2 second-feet).

DIVERSIONS.—The J. J. Crawford ditch diverts from Camp Creek, above the station. The ditch is small and the water is used for irrigation below Placerville.

ACCURACY.—Discharge interpolated for days on which gage was not read. Rating curve well defined below 3,500 second-feet; results good.

Discharge measurements of North Fork of Cosumnes River near El Dorado, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 6	Lasley Lee	2.96	4.4	Apr. 27	Charles Leidl	5.17	38
Feb. 22	Charles Leidl	8.80	2,380	Sept. 1	.....do	2.85	2
22	.....do	8.58	2,250				

[1] "Kings Store" on map of Placerville quadrangle, U. S. Geological Survey.

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lischarge, in second-feet, of North Fork of Cosumnes River near El Dorado, Cal., for the year ending Sept. 30, 1914.

ıy.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	4	8	30	3,560	740	695	352	322	266	49	6	2
.....	4	11	26	2,320	652	652	322	352	266	49	6	2
.....	4	12	23	830	610	610	322	384	240	41	6	2
.....	4	13	20	528	528	568	384	454	240	40	6	2
.....	4	14	17	384	454	568	740	418	191	39	5	2
.....	4	12	17	322	418	568	652	384	169	34	4	2
.....	5	17	17	293	384	568	610	401	215	30	4	2
.....	5	17	17	418	384	568	610	418	191	30	4	2
.....	6	16	17	337	352	610	568	418	149	30	4	2
.....	6	14	17	302	322	610	1,020	401	149	30	4	4
.....	6	17	17	266	322	610	875	352	149	26	4	4
.....	6	23	17	266	293	610	785	368	149	23	4	4
.....	6	39	39	875	293	610	695	337	149	23	4	4
.....	6	32	60	1,750	280	568	695	352	130	23	4	2
.....	6	24	45	1,020	266	568	695	352	114	20	4	2
.....	6	20	30	785	266	610	740	352	140	17	4	2
.....	6	20	29	1,300	308	652	652	352	130	17	4	2
.....	6	20	26	1,960	384	610	610	337	130	17	4	4
.....	6	30	28	1,550	1,300	652	610	322	130	17	2	4
.....	6	39	29	1,140	2,100	652	610	322	122	16	2	4
.....	6	41	30	610	3,980	652	610	293	99	14	2	4
.....	6	30	85	6,750	2,250	652	528	308	92	11	2	4
.....	6	23	114	2,780	1,960	652	528	322	85	11	2	4
.....	6	22	85	2,920	1,420	610	454	384	85	11	2	4
.....	6	22	293	6,930	975	568	418	418	85	11	2	4
.....	6	30	149	3,640	830	528	384	322	85	11	2	4
.....	6	39	85	2,550	785	490	384	293	72	8	2	4
.....	6	39	72	1,750	740	454	352	293	60	6	2	4
.....	6	39	86	1,360	.....	454	352	293	60	6	2	4
.....	7	34	99	1,080	.....	418	322	293	60	6	2	4
.....	8	.....	1,680	875	.....	418	.....	280	.....	6	2	.....

.—Discharge determined from a rating curve well defined below 3,500 second-feet. Discharge inter- for days for which gage heights were missing. Gage read about twice a week in October, daily er.

ly discharge of North Fork of Cosumnes River near El Dorado, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accu-racy.
	Maximum.	Minimum.	Mean.		
.....	8	4	5.6	344	C.
ber.....	41	8	23.9	1,420	B.
ber.....	1,680	17	106	6,520	B.
.....	6,930	266	1,660	102,000	B.
y.....	3,980	266	843	46,800	A.
.....	695	418	582	35,800	A.
.....	1,020	322	563	33,500	A.
.....	454	280	352	21,600	A.
.....	266	60	140	8,330	B.
.....	49	6	21.7	1,330	B.
.....	6	2	3.4	209	B.
ber.....	4	2	3.1	184	B.
he year.....	6,930	2	357	258,000	

COSUMNES RIVER AT MICHIGAN BAR, CAL.

ION.—In the NW. ¼ SE. ¼ sec. 36, T. 8 N., R. 8 E., at highway bridge at Michi- n Bar, 5½ miles southwest of Latrobe. The North and Middle forks unite 12 iles above the station.

AGE AREA.—524 square miles.

DS AVAILABLE.—October 20, 1907, to September 30, 1914.

—Vertical staff on downstream end of bridge pier, near left bank. Observer, B. Ruman.

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DISCHARGE MEASUREMENTS.—Made from bridge at gage or by wading.

CHANNEL AND CONTROL.—Sand, gravel, and small boulders; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.0 feet at 7 p. m. January 22 (discharge, 18,200 second-feet); minimum stage recorded, 1.8 feet October 1 to 7 (discharge, 2 second-feet).

1907–1914: Maximum stage recorded, 10.9 feet January 31, 1911 (discharge, 22,400 second-feet); channel dry July 25 to September 16, 1908.

DIVERSIONS.—Douglas and Enterprise ditches (combined capacity about 50 second-feet) divert water from the Middle and South forks. The water is used for power, domestic supply, and irrigation at Plymouth and vicinity. Slug Gulch ditch (capacity 7 or 8 second-feet) also diverts water from the Middle Fork when prior appropriations permit. Michigan Bar canal (capacity about 8 second-feet) heads on the main Cosumnes at Musicdale Creek. No record is available showing the amount of water that is diverted.

ACCURACY.—Conditions favorable for making satisfactory measurements at all stages. Rating curve well defined above 30 second-feet; results excellent.

Discharge measurements of Cosumnes River at Michigan Bar, Cal., during the year ending Sept. 30, 1914.

[Made by Charles Leidl.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Feb. 24	5.75	3,2
Sept. 4	1.95	4.9

Daily discharge, in second-feet, of Cosumnes River at Michigan Bar, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2	6	72	8,200	1,620	1,550	675	595	473	108	8	5
2	2	9	52	4,210	1,340	1,410	675	675	448	95	8	5
3	2	12	46	2,370	1,280	1,280	595	675	430	95	8	5
4	2	12	40	1,340	1,160	1,280	635	760	400	75	8	5
5	2	12	35	1,000	1,100	1,160	1,410	760	400	75	7	4
6	2	12	30	805	1,050	1,160	1,280	760	345	72	7	4
7	2	12	30	718	1,000	1,160	1,160	760	372	68	6	5
8	3	15	28	1,050	850	1,160	1,050	760	400	72	5	5
9	3	12	26	805	850	1,160	1,050	760	335	68	4	5
10	3	12	26	675	760	1,160	1,940	675	295	63	4	5
11	3	12	26	595	675	1,160	1,700	675	259	53	4	5
12	4	14	26	525	675	1,160	1,480	595	250	44	4	5
13	4	39	46	1,340	595	1,160	1,280	675	250	46	4	5
14	5	46	130	5,920	595	1,050	1,230	675	250	35	4	5
15	5	35	108	3,210	595	1,050	1,280	675	250	33	5	5
16	5	30	72	1,860	595	1,160	1,280	675	250	30	5	5
17	5	24	59	2,560	595	1,160	1,220	675	242	26	5	5
18	5	18	46	6,550	800	1,160	1,050	595	230	26	5	5
19	5	24	49	2,760	3,210	1,160	1,050	595	210	26	5	5
20	5	63	46	1,020	3,700	1,160	1,160	595	210	22	5	5
21	5	53	46	1,280	10,400	1,160	1,050	539	192	18	5	5
22	5	60	169	13,900	5,910	1,160	1,000	560	182	18	5	6
23	5	46	345	5,920	4,210	1,160	950	595	151	18	5	6
24	5	35	192	6,870	2,980	1,050	850	635	169	18	5	6
25	5	26	460	11,500	2,460	1,050	760	595	203	18	3	6
26	5	32	492	10,800	2,100	950	718	635	182	12	3	6
27	5	53	272	5,920	1,940	900	675	595	151	12	3	6
28	5	83	192	3,700	1,700	850	675	560	145	10	3	6
29	5	95	175	2,760	.....	950	675	473	125	10	3	6
30	5	75	272	2,100	.....	1,000	595	492	120	8	5	6
31	5	.....	5,920	1,780	.....	805	.....	460	.....	8	5	.....

NOTE.—Discharge determined from a rating curve well defined above 30 second-feet.

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Monthly discharge of Cosumnes River at Michigan Bar, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	5	2	4.0	246	D.
November	95	6	32.6	1,940	A.
December	5,920	26	307	18,900	A.
January	13,900	525	3,700	228,000	A.
February	10,400	595	1,960	109,000	A.
March	1,550	805	1,130	69,500	A.
April	1,940	595	1,040	61,900	A.
May	760	460	637	39,200	A.
June	473	120	264	15,700	A.
July	108	8	41.4	2,550	A.
August	8	3	5.0	307	D.
September	6	4	5.2	309	D.
The year	13,900	2	754	548,000	

GOOSE LAKE BASIN.

DREWS CREEK RESERVOIR NEAR LAKEVIEW, OREG.

Location.—Dam is in SE. ¼ sec. 5, T. 40 S., R. 18 E., about 14 miles southwest of Lakeview. Reservoir is about 10 miles in length.

Records available.—February 26, 1913, to September 30, 1914; occasional readings.

Gage.—Readings obtained by measuring down from the floor of the gate house. Gage datum is lowest contour of reservoir.

Outlets.—A tunnel with sill at elevation 16.3 feet and a blow-out pipe in center of dam at bottom.

Regulation.—Reservoir was filled up to outlet tunnel during winter 1911–12, but was practically empty October 1, 1912. The rate of filling between that date and March 31, 1913, has been estimated.

Accuracy.—Estimates of increase or decrease of volume of storage prior to 1914 only approximate, as the readings of water stage are very rough; error for entire year probably not great.

Extremes of stage.—Maximum stage recorded during year, 53.4 feet April 18 to 20 (quantity stored, 55,500 acre-feet); minimum stage, 35.0 feet October 1 (quantity stored, 7,960 acre-feet).

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Daily gage height, in feet, of Drews Creek reservoir near Lakeview, Oreg., for the year ending Sept. 30, 1914.

Day.	Oct.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Sept.
1	3.50			41.2	50.2	52.6			
2					50.2	52.5			
3					50.2	52.4			
4					50.3	52.3			
5		39.5			50.6	52.2			
6					50.8	52.0	47.0		41.8
7					51.0	51.8			
8					51.1	51.7			
9				42.1	51.3	51.5			
10			40.9		51.9	51.2			
11					52.2	51.0			
12				44.0	52.4	50.9			
13					52.5	50.8	46.5		41.7
14					52.6	50.6			
15					52.9	50.5			
16					53.2	50.3			
17				46.8	53.3	50.2		44.4	
18				47.5	53.4	50.0			
19				48.1	53.4	49.8			41.6
20				48.5	53.4	49.5			
21				49.0	53.3	49.3			
22				49.4	53.2	49.1		44.2	
23				49.8	53.2	48.9			
24				50.0	53.1	48.7			
25				50.1	53.0	48.6			
26				50.2	52.4	48.4			41.5
27				50.3	52.8	48.2			
28				50.2	52.7	48.0			
29				50.2	52.7	47.8			
30				50.2	52.7	47.6			
31				50.2					

Estimated monthly gain or loss in storage, in acre-feet, in Drews Creek reservoir near Lakeview, Oreg., for the year ending Sept. 30, 1914.

Month.	Gain or loss in acre-feet.	Month.	Gain or loss in acre-feet.	Month.	Gain or loss in acre-feet.
October	+1,620	March	+25,200	August	−3,370
November	+1,160	April	+ 9,100	September	−2,200
December	+1,560	May	−17,700		
January	+4,500	June	− 6,120	The year	+10,600
February	+1,450	July	− 4,480		

NOTE.—Estimated from gage-height record and storage table furnished by Goose Lake Valley Irrigation Co. Estimates approximate, as no correction was made for evaporation or other losses. Amount of storage on Oct. 1, 1913, 7,960 acre-feet.

DREWS CREEK NEAR LAKEVIEW, OREG.

LOCATION.—In the SW. ¼ sec. 4, T. 40 S., R. 18 E., at highway bridge, about ½ mile below mouth of Willow Creek, 1 mile below the Drews Creek reservoir 13 miles southwest of Lakeview, Lake County.

DRAINAGE AREA.—211 square miles.

RECORDS AVAILABLE.—January 16, 1909, to September 30, 1914.

GAGE.—Friez water-stage recorder since March 19, 1912, referred to vertical staff installed on highway bridge March 1, 1910. Two gages had previously been used—an inclined staff at station No. 1, at the dam site 1 mile above present gage, January 16 to May 31, 1909; and vertical staff at station No. 2, at a dump-car bridge 100 feet below the dam site, November 20, 1909, to February 28, 1910.

DISCHARGE MEASUREMENTS.—Made from wagon bridge or by wading.

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CHANNEL AND CONTROL.—Gravel and sand; shifts slightly; drift and aquatic growths may collect on control occasionally and affect discharge relation. At highest stages water flows into a second channel.

EXTREMES OF DISCHARGE.—Maximum stage during year, 4.51 feet, April 19, 11 p. m., and April 20, 5 p. m. (discharge, 481 second-feet); minimum stage, 1.80 feet, October 18 and 19 (discharge, 2 second-feet).

WINTER FLOW.—Stage-discharge relation not affected by ice on account of the proximity of the reservoir.

DIVERSIONS.—The North Drews canal of the Goose Lake Valley Irrigation Co. diverts above the station; record of discharge kept.

REGULATION.—Since the last part of 1912 water has been stored in the reservoir of Goose Lake Valley Irrigation Co. just above the station. A negligible amount of water was stored prior to this time.

ACCURACY.—Results for 1914 only fair on account of shifting channel and lack of sufficient measurements. Prior to the construction of the dam records were subject to considerable error on account of diurnal fluctuation.

Discharge measurements of Drews Creek near Lakeview, Oreg., during the year ending Sept. 30, 1914.

[Made by James E. Stewart.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Apr. 25	4.28	358	June 17	2.51	32	July 27	3.26	100
26	3.93	302	July 27	3.07	68			

Daily discharge, in second-feet, of Drews Creek near Lakeview, Oreg., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3	44	42	59	46	90	286	271	92	28	25	21
2	3	44	42	110	46	69	286	310	92	29	25	21
3	3	43	42	66	46	65	300	310	92	31	25	21
4	3	43	42	63	46	78	314	310	92	31	25	21
5	3	44	42	60	46	110	300	366	92	32	23	21
6	3	43	42	59	46	103	300	396	92	32	19	24
7	3	43	42	59	46	103	286	366	92	33	19	23
8	3	42	42	58	46	98	300	310	90	34	20	23
9	3	42	42	58	46	94	328	338	92	34	20	23
10	3	42	42	56	46	92	342	338	92	35	20	23
11	3	42	42	56	46	98	314	338	92	36	20	23
12	2	42	42	55	46	94	314	338	92	34	20	23
13	2	43	42	55	47	96	314	338	92	31	20	23
14	2	43	42	54	50	98	314	338	92	30	20	23
15	2	43	42	52	49	98	328	338	43	31	20	22
16	2	43	43	51	49	98	328	338	32	31	22	22
17	2	43	43	51	47	94	385	338	31	31	22	22
18	2	43	43	51	46	86	446	338	31	28	22	22
19	2	43	43	50	46	78	478	338	32	26	22	22
20	30	43	42	50	54	134	478	338	33	25	22	22
21	63	42	42	50	73	210	478	338	29	25	22	22
22	59	42	42	49	59	210	462	338	29	26	22	22
23	54	42	42	49	56	210	462	338	29	26	22	22
24	50	43	42	49	59	210	428	338	28	26	22	22
25	45	42	42	52	58	222	396	338	28	26	22	21
26	44	42	42	51	58	247	284	338	28	35	22	24
27	45	42	39	50	58	273	284	338	25	63	21	24
28	45	42	39	50	73	210	271	234	25	25	21	24
29	45	42	38	49	.....	286	258	210	25	25	21	23
30	45	42	41	47	.....	273	246	210	27	25	21	23
31	44	.....	65	46	.....	286	.....	158	.....	25	21	.....

NOTE.—Discharge determined as follows: Oct. 1 to Mar. 28 from well-defined rating curve; Apr. 24 to June 0 from poorly defined curve; Mar. 29 to Apr. 23 and June 21 to Sept. 30 by indirect method for shifting channels.

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Monthly discharge of Drews Creek near Lakeview, Oreg., for the year ending Sept. 30, 1914

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	63	2	19.9	1,220	B.
November	44	42	42.6	2,530	B.
December	65	38	42.5	2,610	B.
January	110	46	55.3	3,400	B.
February	73	46	51.2	2,840	B.
March	286	65	146	8,980	B.
April	478	246	344	20,500	B.
May	396	158	318	19,600	B.
June	92	25	58.7	3,490	B.
July	63	25	30.6	1,880	B.
August	25	19	21.5	1,320	C.
September	24	21	22.4	1,330	C.
The year	478	2	96.2	69,700	

NOTE.—Total yearly run-off, including that of North Drews canal, and allowing for increased storage in Drews Creek reservoir, is 91,600 acre-feet.

NORTH DREWS CANAL NEAR LAKEVIEW, OREG.

LOCATION.—In sec. 3, T. 40 S., R. 18 E., nearly opposite the station on Drews Creek, about 2 miles below headgate at the Drews Creek dam, and one-third mile above a spillway.

RECORDS AVAILABLE.—March 18 to Sept. 30, 1914.

GAGE.—Vertical staff on right side of flume at station 107. Gage above a 10-foot Cippoletti weir was used March 18 to April 24; gage read once a day by S. C. Campbell.

DISCHARGE MEASUREMENTS.—Made from collar of flume.

CHANNEL AND CONTROL.—12-foot wooden flume. Practically all readings in 1914 made when wasteway below gage was open.

EXTREMES OF DISCHARGE.—Maximum recorded discharge during year, 102 second-feet (gage reading 2.10 feet on gage above weir, Mar. 28); minimum discharge, zero.

ACCURACY.—Results poor except for May on account of lack of gage readings.

The canal diverts from Drews Creek at reservoir dam in SE. ¼ sec. 5; water will be used for irrigation, but during 1914 was diverted only to keep flume wet and was wasted into creek below the gages on both canal and creek.

Discharge measurements of North Drews canal near Lakeview, Oreg., during the year ending Sept. 30, 1914.

[Made by James E. Stewart.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Apr. 27	1.79	57.4	July 27	1.24	28.9	July 27	0.24	1.20
June 17	1.65	58.0	.....do	.93	16.8			

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Daily discharge, in second-feet, of North Drews canal near Lakeview, Oreg., for the year ending Sept. 30, 1914.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1		0	19				
2		0	19				
3		0	19				
4		0	19				
5		0	19				7.5
6		0	62				2.0
7		0	62				
8		0	53				
9		0	53				
10		0	53				
11		0	53				
12		0	53				
13		0	53				1.8
14		0	53				
15		0	53			28	
16		0	53			7.5	
17		10	53	58			
18	46	10	53				
19	46	20	53				1.7
20	46	24	53				
21	46	39	53				
22	46	39	53				
23	47	39	53				
24	47	39	53				
25	47	25	53				
26	62	50	53				
27	62	57	53		30		1.6
28	102	19	46				
29	0	19	46				
30	0	19	46				
31	0		46				

NOTE.—Discharge Mar. 18–28 and Apr. 19–24 determined from rating for 10-foot Cippoletti weir; May 1 to Sept. 30 from well-defined rating curve; Apr. 17, 18, 25, 26, and 28–30 and May 31 estimated; estimate Apr. 27 based on meter measurement.

Monthly discharge of North Drews canal near Lakeview, Oreg., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
March 18–31	102	0	42.3	1,170	C.
April	57	0	13.6	809	C.
May	62	19	47.2	2,900	B.
June			[a] 50	2,980	D.
July			[a] 35	2,150	D.
August			[a] 18	1,110	D.
September			2.9	173	D.
The period				11,300	

[a] Estimated.

COTTONWOOD CREEK NEAR LAKEVIEW, OREG.

LOCATION.—In the SW. ¼ sec. 29, T. 38 S., R. 19 E., about one-half mile below dam site of a proposed storage reservoir, 10 miles northwest of Lakeview, Lake County.

DRAINAGE AREA.—30 square miles.

RECORDS AVAILABLE.—November 22, 1908, to September 30, 1914.

GAGE.—Vertical staff on left bank, read once a day by C. B. Mellott; from November 22, 1908, to January 18, 1909, a gage just above a weir one-fourth mile below the dam site was used.

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DISCHARGE MEASUREMENTS.—Made from a footbridge 40 feet below the present gage; at low stages made by wading near the gage.

CHANNEL AND CONTROL.—Clean gravel; somewhat shifting, zero flow occurs at gage height about 0.1 foot.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.3 feet April 15 (discharge, 320 second-feet); minimum stage recorded ,0.10 foot September 10 to 18 and 21 and 22 (discharge, 1 second-foot).

WINTER FLOW.—Stage-discharge relation seriously affected by ice; flow estimated from temperature records observer's notes, and comparison with Chewaucan River, near Paisley.

DIVERSIONS.—None above the station.

ACCURACY.—Results apparently good except during the spring, when there is a large diurnal fluctuation due to melting snow.

Discharge measurements of Cottonwood Creek near Lakeview, Oreg., during the year ending Sept. 30, 1914.

[Made by James E. Stewart.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Apr. 28	1.24	58
June 16	.67	25
July 25	.39	8.3

Daily discharge, in second-feet, of Cottonwood Creek near Lakeview, Oreg., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2.4	11	7	102	9	39	54	87	44	14	6.0	1.4
2	2.4	7	7	92	9	39	62	79	44	13	6.0	1.7
3	3.0	7	7	66	9	42	62	72	44	13	6.0	2.0
4	3.0	9	7	46	9	46	118	72	44	13	5.7	1.4
5	3.6	26	7	39	9	62	130	79	51	13	5.4	1.4
6	3.6	20	9	39	9	70	130	79	51	13	5.4	1.4
7	4.0	18	9	26	9	118	130	79	51	13	5.4	1.4
8	4.0	11	7	20	9	107	142	79	44	13	6.0	1.4
9	4.6	7	7	18	11	136	270	79	44	12	6.0	1.4
10	3.6	9	7	18	11	167	239	79	44	12	6.0	1.0
11	5.5	7	7	18	11	130	239	72	37	9	6.0	1.0
12	5.5	11	7	18	9	130	224	72	51	9	5.7	1.0
13	4.6	9	7	15	9	154	224	79	48	9	5.4	1.0
14	5.5	7	7	15	9	167	209	87	40	9	5.0	1.0
15	4.6	9	7	15	9	167	320	87	37	9	4.5	1.0
16	5.5	9	7	15	9	167	270	97	36	9	4.5	1.0
17	4.6	9	7	39	9	194	239	97	31	9	3.0	1.0
18	4.0	11	7	32	9	194	224	87	31	9	3.0	1.0
19	4.0	15	7	26	11	180	154	87	34	9	3.0	2.0
20	4.0	15	7	26	11	142	154	79	32	10	3.0	1.4
21	4.0	26	7	20	15	167	142	72	32	10	3.0	1.0
22	4.0	20	7	20	20	142	142	72	31	9	3.0	1.0
23	4.0	23	7	18	26	130	142	72	30	8.4	3.0	2.0
24	4.0	20	7	11	32	130	130	72	36	8.4	3.0	3.0
25	4.0	20	11	11	36	118	130	72	54	8.4	3.0	3.0
26	4.0	11	7	11	39	107	97	72	34	6.6	2.6	3.0
27	4.0	11	7	11	39	107	72	72	25	6.6	2.6	3.0
28	4.0	7	6	11	46	78	58	65	22	6.6	2.6	3.0
29	3.6	9	6	7	.....	54	72	65	19	6.3	2.6	3.0
30	5.5	9	21	9	.....	62	107	51	14	6.0	2.2	3.0
31	4.6	.....	32	9	.....	39	.....	44	.....	6.0	1.8	.....

NOTE.—Discharge determined from two fairly well defined rating curves applicable Oct. 1 to Apr. 15 and Apr. 16 to Sept. 30. Stage-discharge relation affected by ice Dec. 12 to Feb. 26; flow estimated from temperature records and observer's notes.

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Monthly discharge of Cottonwood Creek near Lakeview, Oreg., for the year ending Sept. 30, 1914.

[Drainage area, 30 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	5.5	2.4	4.12	0.137	0.16	253	C.
November	26	7	12.8	.427	.48	762	C.
December	32	6	8.5	.283	.33	523	D.
January	102	7	26.5	.883	1.02	1,630	D.
February	46	9	15.8	.527	.55	878	D.
March	194	39	116	3.87	4.46	7,130	B.
April	320	54	156	5.20	5.80	9,280	B.
May	97	44	76.0	2.53	2.92	4,670	B.
June	54	14	37.8	1.26	1.41	2,250	B.
July	14	6	9.75	.325	.37	600	C.
August	6	1.8	4.21	.140	.16	259	C.
September	3	1.0	1.70	.057	.06	101	C.
The year	320	1.0	39.1	1.30	17.72	28,300	

THOMAS CREEK NEAR LAKEVIEW, OREG.

LOCATION.—In NW. ¼ sec. 22, T. 38 S., R. 19 E., at site of proposed diversion dam, about 8 miles below the proposed Thomas Creek reservoir, and about 10 miles northwest of Lakeview, Lake County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—January 1, 1912, to September 30, 1914.

GAGE.—Vertical staff driven in creek bed near left bank 300 feet above highway bridge; read daily in flood periods and twice a week at other times by George Wright. Readings beginning April 13, 1914, refer to a datum 0.46 foot lower than that previously used. Former gage used January 1 to March 9, 1912, also December 1, 1912, to February 29, 1913, was on right abutment of bridge over most southern of three channels into which creek divides at the road crossing.

DISCHARGE MEASUREMENTS.—Made by wading at all but highest stages, when measurements may be made from the highway bridge at the old gage.

CHANNEL AND CONTROL.—Sand, gravel, and yellow clay. Evidently shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 4.15 feet, 2 p. m. April 15 (discharge, 440 second-feet); minimum stage recorded, 1.30 feet July 20, 31, and August 8 (discharge, 1.8 second-feet).

WINTER FLOW.—Stage-discharge relation not affected by ice, owing to springs above gage.

DIVERSIONS.—No data.

ACCURACY.—Results only fair, on account of unstable channel, diurnal fluctuation in the early spring, and infrequency of gage readings.

Discharge measurements of Thomas Creek near Lakeview, Oreg., during the year ending Sept. 30, 1914.

[Made by James E. Stewart.]

Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*
Apr. 28	2.24	55
June 16	1.62	9.2
July 25	1.35	2.3

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Daily discharge, in second-feet, of Thomas Creek near Lakeview, Oreg., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3.0	5.0	6.2	7.0	10	20	27	54	23	4.5	1.9	2.0
2	3.0	5.0	6.2	7.0	10	24	35	54	20	4.0	1.9	2.0
3	3.0	5.0	6.2	7.0	10	23	52	62	20	4.1	2.0	2.0
4	3.0	5.0	6.2	11	10	22	92	69	20	4.2	2.0	2.0
5	3.2	6.0	6.2	15	10	21	98	69	20	4.3	2.0	2.0
6	3.4	7.0	6.2	19	10	24	105	63	20	4.4	1.9	2.0
7	3.6	6.6	5.8	33	10	27	98	59	24	4.6	1.8	2.0
8	3.8	6.2	5.4	26	9.4	31	92	66	27	3.8	1.8	2.0
9	3.8	6.2	5.0	20	8.8	35	126	71	24	3.0	1.9	2.0
10	3.8	6.2	5.0	13	8.2	65	216	65	20	3.0	2.0	2.0
11	3.8	6.2	5.0	13	8.2	96	181	59	16.9	3.0	2.0	2.0
12	3.6	5.9	5.0	13	8.2	126	145	56	13.5	3.0	2.1	2.0
13	3.2	5.6	5.0	13	8.2	112	109	56	13.5	2.9	2.2	2.0
14	3.0	5.3	5.0	12	8.2	117	125	56	11.5	2.8	2.3	2.0
15	3.0	5.0	5.0	11	8.2	121	440	77	9.5	2.6	2.4	2.0
16	3.0	5.4	5.0	10	8.2	126	245	77	8.5	2.4	2.4	2.0
17	3.0	5.8	5.0	10	8.2	112	125	69	8.2	2.2	2.4	2.0
18	3.0	6.2	5.0	10	9.1	143	134	61	8.0	2.0	2.4	2.0
19	3.0	6.2	5.0	10	10	119	142	54	7.8	1.9	2.4	2.0
20	3.0	6.2	5.0	10	10	143	151	56	6.8	1.8	2.4	2.1
21	3.0	6.2	5.0	9.4	11	123	95	59	6.2	1.9	2.4	2.2
22	3.2	6.2	5.0	8.8	12	118	31	54	5.6	2.0	2.4	2.3
23	3.4	6.2	5.0	8.2	13	112	95	48	5.0	2.0	2.4	2.5
24	3.6	6.2	5.0	8.2	13	95	81	46	7.5	2.2	2.4	2.7
25	3.8	6.2	5.0	8.8	12	83	61	43	10.0	2.4	2.4	2.8
26	3.8	6.2	5.0	9.4	12	62	59	40	12.5	2.2	2.3	2.9
27	3.8	6.2	5.0	10	12	60	58	37	7.8	2.0	2.2	2.9
28	3.8	6.2	5.5	10	16	43	56	34	6.8	1.8	2.1	3.0
29	4.1	6.2	6.0	10	.....	38	52	32	5.7	1.8	2.0	3.0
30	4.4	6.2	6.5	10	.....	33	50	29	5.0	1.8	2.0	3.0
31	4.7	.....	7.0	10	.....	33	.....	26	.....	1.8	2.0	.....

NOTE.—Discharge determined from 2 fairly well defined rating curves applicable Oct. 1 to Apr. 10 and Apr. 13 to Sept. 30. Gage read twice a week except Mar. 12 to May 19, when it was read nearly every day. Discharge interpolated for days on which gage was not read.

Monthly discharge of Thomas Creek near Lakeview, Oreg., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	4.7	3.0	3.45	212	C.
November	7.0	5.0	5.93	353	B.
December	7.0	5.0	5.43	334	B.
January	33	7.0	12.0	738	C.
February	16	8.2	10.1	561	C.
March	143	20	74.4	4,570	C.
April	440	27	113	6,720	C.
May	77	26	54.9	3,380	B.
June	27	5	13.3	791	B.
July	4.6	1.8	2.79	172	C.
August	2.4	1.8	2.15	132	C.
September	3.0	2.0	2.25	134	C.
The year	440	1.8	25.0	18,100	

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SACRAMENTO RIVER BASIN.

SACRAMENTO RIVER AT CASTELLA, CAL.

ɔN.—In sec. 22, T. 38 N., R. 4 W., at private highway bridge at Castella, ıt half a mile below the mouth of Castle Creek.

GE AREA.—257 square miles.

S AVAILABLE.—October 15, 1910, to September 30, 1914.

-Vertical staff on downstream end of bridge pier near right bank.

ıGE MEASUREMENTS.—Made from bridge at Sweet Brier Camp, one-half mile ɔw gage. This section is more satisfactory than that at the upper bridge, ɜre early measurements were made.

L AND CONTROL.—Small boulders; rough; fairly permanent.

ES OF DISCHARGE.—1910–1914: Maximum stage recorded, 13.7 feet at 5.50 ı. January 2, 1914 (discharge roughly approximated from extension of rating ve, 16,000 second-feet); minimum stage recorded, 2.5 feet during parts of ɔber, 1912, August, September, and October, 1913, and August, 1914 (dis-ge, 200 second-feet).

ɔY.—Rating curve fairly well defined; results good.

ıTION.—Gage-height record furnished by H. O. Wickes.

e measurements of Sacramento River at Castella, Cal., during the year ending Sept. 30, 1914.

Made by—	Gage height.	Dis-charge.
	Feet.	*Sec.-ft.*
Charles Leidl	5.20	2,390
H. J. Tompkins	3.42	683

ıcharge, in second-feet, of Sacramento River at Castella, Cal., for the year ending Sept. 30, 1914.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	200	212	335	3,930	900	1,810	1,380	1,590	1,700	580	295	200
.....	200	212	295	12,200	860	1,590	1,480	1,810	1,590	550	295	200
.....	200	212	295	4,530	780	1,480	1,590	3,080	1,590	520	278	200
.....	200	212	295	3,930	745	1,430	4,530	2,290	1,430	520	278	200
.....	200	278	260	2,810	710	1,480	4,530	2,050	1,380	470	278	200
.....	200	335	260	1,930	640	1,930	3,360	2,550	1,020	445	278	200
.....	200	260	260	1,810	640	1,930	2,810	2,170	940	420	278	200
.....	200	225	260	1,480	640	2,050	2,550	2,050	900	420	278	200
.....	200	225	260	1,280	640	2,170	2,940	2,050	900	398	260	200
.....	200	225	260	1,020	640	2,420	2,940	2,050	900	398	260	200
.....	200	225	335	940	640	2,680	2,940	2,050	940	375	260	200
.....	200	225	335	860	640	2,550	2,550	2,050	940	375	242	200
.....	200	225	780	860	640	2,550	2,290	2,170	940	375	242	200
.....	200	225	520	1,590	640	2,550	2,290	2,290	940	355	242	200
.....	200	225	420	1,480	640	2,420	4,380	2,420	940	335	242	200
.....	200	225	375	1,190	710	2,420	3,220	2,550	1,020	335	225	260
.....	200	225	355	1,590	940	2,420	2,290	2,170	1,020	335	225	225
.....	200	375	335	1,240	2,050	2,420	2,420	2,170	1,020	335	225	260
.....	200	295	315	1,020	3,640	2,420	3,080	2,050	940	335	212	260
.....	200	242	295	1,020	4,830	2,420	3,080	2,290	900	335	212	260
.....	200	260	295	1,140	6,360	2,420	2,680	2,290	860	335	212	242
.....	200	260	295	1,020	3,360	2,680	2,170	2,290	780	335	212	242
.....	200	225	295	1,020	2,170	2,680	2,050	1,810	710	315	212	225
.....	200	225	295	1,590	1,810	2,420	1,700	1,810	820	315	212	225
.....	200	335	335	2,550	1,480	2,050	1,590	1,700	780	315	212	225
.....	200	940	335	2,550	1,330	1,810	1,590	1,590	745	315	212	225
.....	200	1,240	315	2,810	1,240	1,590	1,480	1,590	675	315	200	225
.....	200	520	295	1,280	1,100	1,480	1,380	1,590	610	315	200	225
.....	200	375	315	1,020	.....	1,590	1,280	1,590	580	295	200	225
.....	200	375	355	1,020	.....	1,480	1,280	1,700	580	295	200	225
.....	200	.....	8,320	900	.....	1,480	.....	1,810	.....	295	200	.....

ɔDischarge determined from a fairly well defined rating curve.

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Monthly discharge of Sacramento River at Castella, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 257 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	200	200	200	0.778	0.90	12,300	B.
November	1,240	212	321	1.25	1.40	19,100	B.
December	8,320	260	590	2.30	2.65	36,300	B.
January	12,200	860	2,050	7.98	9.20	126,000	C.
February	6,360	640	1,480	5.76	6.00	82,200	C.
March	2,680	1,430	2,090	8.13	9.37	129,000	C.
April	4,530	1,280	2,460	9.57	10.68	146,000	C.
May	3,080	1,590	2,050	7.98	9.20	126,000	C.
June	1,700	580	970	3.77	4.21	57,700	C.
July	580	295	376	1.46	1.68	23,100	B.
August	295	200	238	.926	1.07	14,600	B.
September	260	200	218	.848	.95	13,000	B.
The year	12,200	200	1,090	4.24	57.31	785,000	

SACRAMENTO RIVER NEAR RED BLUFF, CAL.

LOCATION.—In lot 4, sec. 34, T. 28 N., R. 3 W., at the lower end of Iron Canyon, 4 miles northeast of Red Bluff, and about 3 miles below the Iron Canyon dam site. Paines Creek enters about 3 miles above and Antelope Creek about 7 miles below the station.

DRAINAGE AREA.—9,300 square miles, not including the drainage area of Goose Lake—1,090 square miles—which belongs naturally in Pit River basin but has contributed no water except for a short time in 1869 and for more than two hours during a severe storm from the north in 1881, when the lake overflowed to North Fork of Pit River. Previously published figures of discharge in second-feet per square mile and run-off in depth in inches, based on the drainage area including Goose Lake, should be used with caution because of the large noncontributing area.

RECORDS AVAILABLE.—January 28, 1902, to September 30, 1914. The State engineer in 1879 and the commissioner of public works in 1893 and 1894 made measurements at this point. From April 30, 1895, to June 30, 1902, a gaging station was maintained at Jellys Ferry, 12 miles above Red Bluff.

GAGE.—Staff in seven sections on left bank. Several gages have been used at this station, but all observations have been reduced to the present datum. Observer, Richard Groebe.

CHANNEL AND CONTROL.—Coarse gravel and small boulders; practically permanent.

DISCHARGE MEASUREMENTS.—Made from cable 50 feet above gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 27.6 feet at 9 a. m. January 1 (discharge, 183,000 second-feet); minimum stage recorded, 1.0 foot October 1 to 7 (discharge, 4,390 second-feet).

1902–1914: Maximum stage recorded, 35.2 feet February 3, 1909 (discharge 278,000 second-feet); minimum stage recorded, 0.9 foot September 7 to 28, 1913 (discharge, 3,980 second-feet).

DIVERSIONS AND STORAGE.—No storage of any importance has been developed in the drainage basin above the station. A small amount of water is diverted from some of the minor tributaries for irrigation.

ACCURACY.—Rating curve well defined except for extremely high stages; result excellent.

The following discharge measurement was made by Charles Leidl.

September 12, 1914: Gage height, 1.30 feet; discharge, 4,940 second-feet.

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Daily discharge, in second-feet, of Sacramento River near Red Bluff, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4,390	4,790	7,710	151,000	25,800	28,500	25,800	17,400	12,600	8,300	5,650	5,210
2	4,390	5,210	7,160	144,000	23,600	29,400	21,400	17,400	12,200	8,000	5,650	5,210
3	4,390	5,000	6,890	116,000	21,900	28,000	21,400	19,000	12,200	7,710	5,650	5,210
4	4,390	5,000	6,370	75,800	19,800	26,700	21,400	18,600	11,500	7,710	5,650	5,210
5	4,390	5,210	6,120	54,400	19,000	25,800	47,500	18,200	10,900	7,710	5,650	5,210
6	4,390	7,160	6,120	40,000	17,800	25,800	39,000	18,200	10,200	7,430	5,650	5,210
7	4,390	6,630	5,880	42,100	16,600	27,200	31,300	17,800	16,200	7,160	5,650	5,210
8	4,590	6,120	5,650	37,000	16,200	27,600	28,000	17,800	11,900	7,160	5,430	5,210
9	4,590	5,210	5,650	31,800	15,900	27,600	28,500	17,400	11,200	7,160	5,430	5,210
10	4,590	5,210	5,650	26,200	15,100	27,600	43,200	17,000	10,500	7,160	5,430	5,210
11	4,590	5,210	6,890	23,200	15,100	27,600	37,000	16,200	10,200	7,160	5,430	5,210
12	4,590	5,210	6,890	25,800	14,800	27,600	33,200	15,900	9,860	6,890	5,430	5,000
13	4,590	5,210	16,200	29,900	14,800	27,200	30,300	15,500	9,540	6,890	5,430	5,000
14	4,590	5,000	15,100	97,600	14,400	25,800	28,500	15,500	9,540	6,890	5,210	5,000
15	4,590	5,000	9,860	70,900	14,400	25,400	28,000	15,900	9,540	6,630	5,210	5,210
16	4,590	5,000	11,500	43,200	14,800	24,000	31,300	15,900	9,220	6,630	5,210	5,210
17	4,590	5,210	7,710	67,500	15,900	24,000	28,500	15,100	8,910	6,370	5,210	5,210
18	4,590	9,540	7,160	72,300	21,900	23,600	25,800	14,400	8,910	6,370	5,210	5,430
19	4,590	12,600	6,890	48,600	59,800	23,600	26,200	14,400	8,600	6,370	5,210	5,430
20	4,590	6,890	6,630	54,400	102,000	23,600	27,200	14,400	8,600	6,370	5,210	5,210
21	4,590	6,120	8,000	101,000	160,000	23,200	26,700	14,000	8,300	6,370	5,210	5,210
22	4,590	5,880	23,200	122,000	94,400	22,700	24,500	14,000	8,300	6,120	5,210	5,210
23	4,590	5,430	14,000	60,500	70,200	22,300	25,400	14,000	8,300	6,120	5,210	5,210
24	4,590	5,210	18,600	101,000	49,700	22,300	27,200	14,400	8,300	6,120	5,210	5,210
25	4,590	5,880	40,600	96,000	43,200	21,000	23,600	19,000	14,400	6,120	5,210	5,210
26	4,590	9,540	21,400	101,000	36,100	20,200	22,300	15,500	11,500	6,120	5,210	5,210
27	4,590	28,500	14,800	67,500	31,800	19,800	21,000	13,700	9,860	6,120	5,210	5,210
28	4,590	13,700	12,200	47,500	29,400	18,600	19,400	12,900	9,220	5,880	5,210	5,210
29	4,590	11,500	11,500	40,600	.....	19,800	14,800	12,900	8,910	5,880	5,210	5,210
30	4,590	9,540	25,400	32,200	.....	22,300	18,200	12,600	8,300	5,880	5,210	5,210
31	4,590	.....	139,000	28,000	.....	27,200	.....	12,600	.....	5,650	5,210	.....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Sacramento River near Red Bluff, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	4,590	4,390	4,540	279,000	A.
November	28,500	4,790	7,390	440,000	A.
December	139,000	5,650	15,700	965,000	A.
January	151,000	23,200	66,100	4,060,000	A.
February	160,000	14,400	35,500	1,970,000	A.
March	29,400	18,600	24,700	1,520,000	A.
April	47,500	14,800	27,600	1,640,000	A.
May	19,000	12,600	15,700	965,000	A.
June	14,400	8,300	10,300	613,000	A.
July	8,300	5,650	6,720	413,000	A.
August	5,650	5,210	5,350	329,000	A.
September	5,430	5,000	5,200	309,000	A.
The year	160,000	4,390	18,700	13,500,000	

PIT RIVER NEAR BIEBER, CAL.

LOCATION.—In the NW. ¼ sec. 34, T. 37 N., R. 7 E., about 1 mile below dam site of proposed Big Valley reservoir, at the head of Muck Valley, and 8 miles south of Bieber.

DRAINAGE AREA.—2,950 square miles, not including the drainage area of Goose Lake—1,090 square miles—which belongs naturally in Pit River basin but has contributed no water except for a short time in 1869 and for more than two hours during a severe storm from the north in 1881, when the lake overflowed to North Fork of Pit River. Previously published figures of discharge in second-feet per square mile and run-off in depth in inches, based on the drainage area including Goose Lake, should be used with caution because of the large noncontributing area.

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RECORDS AVAILABLE.—January 22, 1904, to September 30, 1908; December 18, 1913, to August 11, 1914.

GAGE.—Staff in three sections on right bank believed to be at same datum as original gage. Observer, R. A. Ricketts, jr.

DISCHARGE MEASUREMENTS.—Made from cable near gage.

CHANNEL AND CONTROL.—Boulders and solid rock; appears permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.1 feet January 5 (discharge, 9,880 second-feet); minimum stage recorded, 2.15 feet July 4 (discharge, 22 second-feet; record for year incomplete).

1904–1908 and 1914: Maximum stage recorded, 16.4 feet March 19, 1907 (discharge, 27,500 second-feet); minimum stage recorded, 1.35 feet September 8-9, 1905 (discharge, 0.8 second-foot).

ACCURACY.—Discharge measurement made December 18, 1913, checks old curve, which was fairly well defined. Weeds grow in the channel during low water and slightly affect the discharge relation.

COOPERATION.—Station reestablished and maintained in cooperation with the United States Reclamation Service.

Discharge measurements of Pit River near Bieber, Cal., during the year ending Sept. 3, 1914.

Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*
Dec. 18	Charles Leidl	3.22	161
July 1	H. J. Tompkins	2.40	37

Daily discharge, in second-feet, of Pit River near Bieber, Cal., for the year ending Sept. 30, 1914.

Day.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
1	.....	1,900	1,800	2,630	1,420	850	470	36	47
2	.....	2,780	1,600	3,070	1,900	710	420	26	42
3	.....	4,320	1,240	3,070	1,900	640	370	24	36
4	.....	9,060	1,040	3,070	1,900	580	348	22	34
5	.....	9,880	920	2,920	1,700	470	305	24	33
6	.....	9,060	885	3,220	1,510	420	268	30	33
7	.....	9,060	850	3,320	1,510	325	185	37	30
8	.....	4,480	850	3,220	1,420	268	185	46	28
9	.....	3,520	745	3,070	1,420	250	232	57	27
10	.....	2,920	850	3,070	1,330	250	285	70	26
11	.....	2,360	850	3,220	1,510	232	370	78	24
12	.....	1,900	885	3,220	1,600	185	370	90	.....
13	.....	1,240	960	2,920	1,700	155	325	103	.....
14	.....	1,330	1,080	2,780	1,510	142	232	110	.....
15	.....	1,510	1,160	2,360	1,510	155	185	130	.....
16	.....	1,600	1,420	2,240	1,330	170	170	142	.....
17	.....	1,600	1,700	2,010	1,330	200	130	130	.....
18	170	1,240	2,010	1,900	1,510	232	108	110	.....
19	110	1,000	2,500	1,700	1,600	268	90	110	.....
20	130	850	3,220	1,800	1,700	250	75	106	.....
21	250	1,160	3,520	2,010	1,700	215	64	101	.....
22	200	1,900	3,680	2,120	1,600	200	60	99	.....
23	155	2,500	3,370	2,120	1,420	155	56	92	.....
24	155	2,780	3,220	1,900	1,240	155	61	86	.....
25	185	5,540	3,070	1,800	1,160	200	70	83	.....
26	232	6,930	2,920	1,700	960	250	70	77	.....
27	268	4,320	2,630	1,510	850	305	65	76	.....
28	325	5,000	2,360	1,420	1,000	348	70	66	.....
29	370	2,630	.....	1,330	1,000	420	64	59	.....
30	495	2,240	.....	1,240	960	495	59	55	.....
31	1,080	2,010	.....	1,240	.....	520	.....	50	.....

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge Aug. 4–10 interpolated.

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onthly discharge of Pit River near Bieber, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
December 18–31	1,080	110	295	8,190	B.
January	9,880	850	3,500	215,000	C.
February	3,680	745	1,830	102,000	C.
March	3,520	1,240	2,370	146,000	C.
April	1,900	850	1,440	85,700	C.
May	850	142	323	19,900	B.
June	470	56	192	11,400	B.
July	142	22	75.0	4,610	B.
August 1–11	47	24	32.6	711	C.
The period				594,000	

PIT RIVER AT HENDERSON, CAL.

LOCATION.—In sec. 36, T. 37 N., R. 1 W., at Big Bend Ferry, one-fourth mile above Henderson. Nelson Creek enters half a mile above and Kosk Creek 1 mile below the station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 28, 1910, to September 30, 1914.

GAGE.—Gurley electric water-stage recorder 50 feet below vertical staff fastened to an alder tree on left bank about 100 feet above ferry. Original datum has been maintained. The gages do not read exactly the same on account of the slope of the water surface.

DISCHARGE MEASUREMENTS.—Made from cable 25 feet below recording gage.

CHANNEL AND CONTROL.—Boulders and coarse gravel; rough and fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year from recording gage, 5.11 feet January 25 (discharge, 12,800 second-feet); minimum stage, 0.65 foot October 1 to 8 and 13–14 (discharge, 2,560 second-feet).

1910–1914: Maximum stage recorded, 5.3 feet March 25, 1911 (discharge, 13,200 second-feet); minimum stage recorded, 0.60 foot September 23 to 25, 1913 (discharge, 2,490 second-feet).

ACCURACY.—Rating curve is fairly well defined and results are good.

Discharge measurements of Pit River at Henderson, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 29	Charles Leidl	3.33	7,980	July 4	H. J. Tompkins	0.94	3,020
29	do	3.02	7,630				

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Daily discharge, in second-feet, of Pit River at Henderson, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2,560	2,630	2,780	11,700	6,170	6,950	5,500	5,180	3,660	3,110	2,780	2,770
2	2,560	2,700	2,780	10,100	5,720	6,710	5,290	5,080	3,660	3,110	2,780	2,770
3	2,560	2,630	2,700	11,700	5,290	6,710	5,180	5,080	3,660	3,020	2,850	2,770
4	2,560	2,630	2,700	10,900	4,980	6,710	5,400	5,080	3,470	3,020	2,850	2,770
5	2,560	2,700	2,700	9,350	4,760	7,190	5,830	4,980	3,470	3,020	2,850	2,770
6	2,560	2,780	2,700	9,350	4,560	7,670	5,830	4,980	3,470	3,020	2,850	2,770
7	2,560	2,700	2,700	9,100	4,350	7,670	5,720	4,760	3,560	2,940	2,850	2,770
8	2,560	2,700	2,700	8,100	4,250	7,190	5,720	4,660	3,760	2,940	2,850	2,770
9	2,630	2,700	2,700	7,600	4,150	8,170	5,940	4,560	3,760	2,940	2,850	2,770
10	2,630	2,700	2,700	6,880	4,050	8,420	7,120	4,560	3,560	3,020	2,850	2,850
11	2,630	2,700	2,700	5,720	4,150	8,170	7,600	4,450	3,470	3,020	2,850	2,850
12	2,630	2,700	2,700	5,290	4,250	7,360	7,600	4,250	3,380	3,020	2,850	2,850
13	2,560	2,700	2,700	4,760	4,250	7,360	7,360	4,250	3,380	3,020	3,020	2,850
14	2,560	2,700	2,700	5,830	4,350	7,120	6,880	4,150	3,380	3,020	3,020	2,830
15	2,630	2,700	2,780	6,640	4,450	6,880	7,120	4,050	3,200	3,020	3,020	2,830
16	2,630	2,700	2,780	6,400	4,560	7,120	7,120	3,950	3,110	2,940	3,020	2,770
17	2,630	2,700	2,700	6,400	4,760	7,600	6,880	3,950	3,200	2,940	2,850	2,770
18	2,630	2,700	2,700	6,170	4,980	7,850	6,640	3,950	3,110	2,940	2,850	2,770
19	2,630	2,700	2,780	5,400	6,950	7,600	6,640	3,950	3,110	2,940	2,850	2,770
20	2,630	2,700	2,780	5,080	8,170	7,360	6,400	3,950	3,110	2,940	2,850	2,770
21	2,630	2,700	2,700	4,980	9,690	7,120	6,400	3,950	3,110	2,940	2,850	2,770
22	2,630	2,780	2,780	5,080	9,430	6,880	6,400	3,950	3,110	2,940	2,770	2,830
23	2,630	2,780	2,700	5,830	8,670	6,880	6,400	3,950	3,110	2,860	2,770	2,850
24	2,630	2,780	2,700	7,360	8,420	6,640	6,400	4,050	3,290	2,860	2,770	2,850
25	2,630	2,700	2,780	9,350	7,190	6,640	6,170	4,050	3,470	2,860	2,770	2,850
26	2,630	2,700	2,700	12,000	7,430	6,400	5,940	3,950	3,380	2,860	2,770	2,830
27	2,630	2,700	2,700	10,400	6,710	6,400	5,720	3,950	3,380	2,860	2,770	2,830
28	2,630	2,700	2,780	8,600	6,950	6,400	5,610	3,850	3,290	2,860	2,770	2,830
29	2,630	2,780	3,290	8,100	.....	6,170	5,400	3,760	3,200	2,860	2,770	2,850
30	2,630	2,780	6,400	7,120	.....	6,170	5,290	3,660	3,200	2,860	2,770	2,850
31	2,630	.....	8,100	6,640	.....	6,060	.....	3,660	.....	2,860	2,770	.....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of Pit River at Henderson, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	2,630	2,560	2,610	160,000	A.
November	2,780	2,630	2,710	161,000	A.
December	8,100	2,700	3,040	187,000	A.
January	12,000	4,760	7,680	472,000	A.
February	9,690	4,050	5,840	324,000	B.
March	8,420	6,060	7,080	435,000	B.
April	7,600	5,180	6,250	372,000	A.
May	5,180	3,660	4,280	263,000	A.
June	3,660	3,110	3,370	201,000	A.
July	3,110	2,860	2,950	181,000	A.
August	2,850	2,770	2,840	175,000	B.
September	2,850	2,770	2,810	167,000	B.
The year	12,000	2,560	4,280	3,100,000	

PIT RIVER NEAR YDALPOM, CAL.

LOCATION.—In the NW. ¼ sec. 32, T. 34 N., R. 3 W., at Silverthorne Ferry, 1½ miles southwest of Ydalpom, and 7½ miles above junction with Sacramento River. Squaw Creek enters half a mile above and McCloud River 4 miles below the station.

DRAINAGE AREA.—5,260 square miles, not including the drainage area of Goose Lake—1,090 square miles—which belongs naturally in Pit River basin, but has contributed no water except for a short time in 1869 and for more than two hours during a severe storm from the north in 1881, when the lake overflowed to North Fork of Pit River. Previously published figures of discharge in second-feet per square mile and run-off in depth in inches, based on the drainage area including Goose Lake, should be used with caution because of the large noncontributing area.

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RECORDS AVAILABLE.—November 16, 1910, to September 30, 1914.

GAGE.—Vertical staff in two sections fastened to an ash tree on left bank 350 feet below ferry. Observer, M. D. Rodrigue.

DISCHARGE MEASUREMENTS.—Made from cable 50 feet above ferry cable.

CHANNEL AND CONTROL.—Gravel and sand; appears permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 18.2 feet December 31 (approximate discharge, computed from extension of rating curve, 39,000 second-feet); minimum stage recorded, 2.80 feet October 1 to November 2 and August 16 to September 18 (discharge, 2,740 second-feet).

1910–1914: Maximum stage recorded, 18.2 feet December 31, 1913 (approximate discharge, computed from extension of rating curve, 39,000 second-feet); minimum stage recorded, 2.80 feet October 1 to November 2, 1913, and August 16 to September 18, 1914 (discharge, 2,740 second-feet).

DIVERSION.—Water for irrigation is diverted from the main stream and tributaries above the station.

ACCURACY.—Rating curve well defined; results excellent.

Discharge measurements of Pit River near Ydalpom, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
n. 24	Charles Leidl	12.69	27,200	Sept. 15	Charles Leidl	2.88	2,890
ly 8	H. J. Tompkins	3.28	3,420				

Daily discharge, in second-feet, of Pit River near Ydalpom, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	2,740	2,740	3,330	22,900	9,610	11,000	8,540	7,120	4,600	4,260	3,030	2,740
2	2,740	2,740	3,330	32,800	8,540	11,000	8,330	7,120	4,600	4,260	3,030	2,740
3	2,740	3,030	3,180	28,200	7,920	11,000	7,720	6,930	4,600	4,100	3,030	2,740
4	2,740	3,330	3,180	22,300	7,520	10,800	9,610	6,740	4,430	3,940	3,030	2,740
5	2,740	3,330	3,030	20,000	7,320	10,300	15,300	6,740	4,430	3,940	3,030	2,740
6	2,740	3,480	3,030	15,500	6,740	10,500	11,700	6,740	4,430	3,940	3,030	2,740
7	2,740	3,330	3,030	13,700	6,360	11,000	10,500	6,550	4,260	3,780	3,030	2,740
8	2,740	3,330	3,030	13,900	6,360	11,500	9,610	6,550	4,260	3,780	3,030	2,740
9	2,740	3,330	3,030	12,200	6,180	11,500	9,390	6,360	4,260	3,630	3,030	2,740
0	2,740	3,180	3,030	10,500	6,000	11,500	15,000	6,000	4,260	3,480	3,030	2,740
1	2,740	3,030	3,030	8,750	6,000	11,500	15,300	5,640	4,260	3,480	3,030	2,740
2	2,740	3,030	3,330	8,960	6,000	11,500	12,400	5,460	4,100	3,480	2,880	2,740
3	2,740	3,030	3,480	10,100	6,000	11,500	11,200	5,280	4,100	3,480	2,880	2,740
4	2,740	3,030	3,480	21,300	6,000	11,200	10,800	5,280	3,940	3,330	2,880	2,740
5	2,740	3,030	3,330	19,300	6,000	10,500	12,200	5,110	3,940	3,330	2,880	2,740
6	2,740	3,030	3,330	16,100	6,180	10,100	10,800	4,940	3,940	3,330	2,740	2,740
7	2,740	3,030	3,330	13,900	6,180	10,100	10,300	4,940	3,080	3,330	2,740	2,740
8	2,740	3,180	3,330	12,900	12,100	9,610	10,100	4,940	3,630	3,330	2,740	2,740
9	2,740	3,630	3,180	11,700	12,200	9,610	9,610	4,940	3,630	3,330	2,740	2,880
0	2,740	3,630	3,180	16,600	21,600	9,390	9,390	4,940	3,630	3,330	2,740	2,880
1	2,740	3,630	3,330	15,800	31,800	9,170	9,170	4.770	3,630	3,330	2,740	2,880
2	2,740	3,480	3,330	18,400	22,900	8,960	9,170	4,770	3,630	3,330	2,740	2,880
3	2,740	3,480	3,480	16,400	17,800	8,750	8,960	4,940	3,630	3,330	2,740	2,880
4	2,740	3,330	3,780	25,900	15,300	8,750	8,750	5,110	5,280	3,180	2,740	2,880
5	2,740	3,630	5,460	29,600	13,200	8,540	8,540	4,940	4,600	3,180	2,740	2,880
6	2,740	6,550	4,770	27,900	11,900	8,120	8,330	4,940	4,430	3,180	2,740	2,880
7	2,740	5,110	4,260	22,600	11,000	7,720	8,330	4,940	4,260	3,030	2,740	2,880
8	2,740	4,260	3,780	19,300	10,500	7,520	7,920	4,770	4,100	3,030	2,740	2,880
9	2,740	3,630	4,600	13,200	.....	7,920	7,520	4,600	3,940	3,030	2,740	2,880
0	2,740	3,480	7,720	11,900	.....	8,120	7,320	4,600	3,940	3,030	2,740	2,880
1	2,740	.....	33,900	11,000	.....	8,540	.....	4,600	.....	3,030	2,740	.....

NOTE.—Discharge determined from a well-defined rating curve.

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Monthly discharge of Pit River near Ydalpom, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	2,740	2,740	2,740	168,000	A.
November	6,550	2,740	3,470	206,000	A.
December	33,900	3,030	4,600	283,000	A.
January	32,800	8,750	17,500	1,080,000	A.
February	31,800	6,000	10,500	583,000	A.
March	11,500	7,520	9,910	609,000	A.
April	15,300	7,320	10,100	601,000	A.
May	7,120	4,600	5,530	340,000	A.
June	5,280	3,630	4,150	247,000	A.
July	4,260	3,030	3,470	213,000	A.
August	3,030	2,740	2,860	176,000	A.
September	2,880	2,740	2,800	167,000	A.
The year	33,900	2,740	6,450	4,670,000	

HAT CREEK AT HAT CREEK, CAL.

LOCATION.—In the SE. ¼ sec. 10, T. 34 N., R. 4 E., at private highway bridge on Morris ranch, in Lassen National Forest, 1 mile north of Hat Creek post office.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 22, 1910, to September 30, 1914.

GAGE.—Vertical staff fastened to downstream end of right abutment of bridge. Observer, Fred Seaborn.

DISCHARGE MEASUREMENTS.—Made from downstream side of bridge.

CHANNEL AND CONTROL.—Gravel and small boulders; rough; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.81 feet June 25 (discharge, 241 second-feet); minimum stage recorded, 2.00 feet September 3 (discharge, 60 second-feet).

1910–1914: Maximum stage recorded, 2.82 feet June 12, 1911 (discharge, 244 second-feet); minimum stage recorded, 1.80 feet September 19, 1913 (discharge, 32 second-feet).

DIVERSIONS.—On May 13, 1911, nine ditches were diverting a total of 110 second-feet; of this amount it was estimated that 55 second-feet was returned to the stream above the gage.

ACCURACY.—No discharge measurements made during year. Section fairly permanent except that weeds grow in the channel during the summer months; rating curve for previous year used; results fair.

COOPERATION.—Station maintained in cooperation with United States Forest Service.

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Daily discharge, in second-feet, of Hat Creek at Hat Creek, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1			117		117					224		
2				210		117			172			
3				172	117	117						60
4			117	160	117							
5				139						160		
6		119	115				144					
7												
8		115	115					113	117			
9				126			158					
10		115							153	107	81	
11	238	115		115			184					
12									177			
13	238		115	115			160		197			
14		117					179					
15		117		115								
16		115						160	160			
17												
18			115				182	155				
19									210			
20		115	115									
21							184		218			
22												
23	105		115				179					
24		115										
25			115					224	241			
26	97		115									
27	97		115					238	224			
28												
29		122									79	
30		117				135						
31												

NOTE.—Discharge determined from a rating curve fairly well defined by measurements made in previous years.

RISING RIVER NEAR CASSEL, CAL.

LOCATION.—In sec. 8, T. 35 N., R. 4 E., at highway bridge about half a mile above junction with Hat Creek and 1¼ miles south of Cassel.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 15, 1911, to March 23, 1914, when station was discontinued.

GAGE.—Vertical staff on downstream side of bridge pier near left bank.

DISCHARGE MEASUREMENT.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Sand and gravel; fairly permanent.

EXTREMES OF STAGE.—Maximum stage recorded during year, 1.7 feet December 30 and January 1 and 25; minimum stage recorded, 1.3 feet during October, parts of November and December (record for year incomplete).

1911–1914: Maximum stage recorded, 1.70 feet December 30, 1913, and January 1 and 25, 1914; minimum stage recorded, 1.1 feet May 14, 1913 (discharge, 275 second-feet).

ACCURACY.—Stream is only 2 miles long and is fed by springs. Its flow is very constant. Data insufficient for estimates of discharge.

No discharge measurements made during year.

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Daily gage height, in feet, of Rising River near Cassel, Cal., for the year ending Sept. 30, 1914.

[De Forest Hobson, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	1.3	.....	.....	1.7	.....	.....	16	.....	.....	.....	.....	.....	1.4
2	.....	.....	.....	.....	.....	.....	17	.....	.....	.....	.....	.....	.....
3	.....	.....	.....	.....	.....	.....	18	.....	.....	.....	.....	.....	.....
4	.....	.....	.....	.....	.....	1.4	19	.....	.....	.....	.....	.....	.....
5	1.3	1.3	.....	1.6	1.5	.....	20	1.3	1.35	1.4	1.65	.....	.....
6	.....	.....	.....	.....	.....	.....	21	.....	.....	.....	.....	.....	.....
7	.....	.....	.....	.....	.....	.....	22	.....	.....	.....	.....	.....	.....
8	.....	.....	1.3	.....	.....	.....	23	1.3	.....	.....	.....	.....	1.4
9	.....	.....	.....	.....	.....	.....	24	.....	.....	.....	.....	.....	.....
10	1.3	1.3	1.3	1.55	.....	.....	25	1.3	1.3	1.4	1.7	.....	.....
11	.....	.....	.....	.....	.....	.....	26	.....	.....	.....	.....	.....	.....
12	.....	.....	.....	.....	.....	.....	27	.....	.....	.....	.....	.....	.....
13	.....	.....	.....	.....	.....	.....	28	.....	.....	.....	.....	.....	.....
14	.....	.....	.....	.....	.....	1.4	29	.....	.....	.....	.....	.....	.....
15	1.3	1.35	1.4	1.55	.....	.....	30	1.3	1.3	1.7	1.5	.....	.....
							31	.....	.....	.....	.....	.....	.....

KOSK CREEK NEAR HENDERSON, CAL.

LOCATION.—In sec. 12, T. 37 N., R. 1 W., above bridge on Holm ranch, in Shasta National Forest, 4 miles north of Henderson and 3½ miles above the mouth of the creek. Baker Creek enters about one-fourth mile below the station.

DRAINAGE AREA.—51.9 square miles.

RECORDS AVAILABLE.—October 1, 1910, to September 30, 1914 (not complete).

GAGE.—Vertical staff fastened to an alder tree on left bank 100 feet above bridge. Observer, H. R. Powers.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Gravel and small boulders; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 5.8 feet April 14 (discharge, 1,020 second-feet); minimum stage recorded, 2.82 feet October 11 (discharge, 21 second-feet).

1910–1914: Maximum stage unknown; minimum stage recorded, 2.82 feet October 11, 1913 (discharge, 21 second-feet; record incomplete).

ACCURACY.—Rating curve fairly well defined; results good for periods covered by gage heights.

COOPERATION.—Station maintained in cooperation with United States Forest Service.

The following discharge measurement was made by H. J. Tompkins:

July 4, 1914: Gage height, 3.69 feet; discharge, 119 second-feet.

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Daily discharge, in second-feet, of Kosk Creek near Henderson, Cal., for the year ending Sept. 30, 1914.

Day	Oct.	Nov.	Dec.	Apr.	May.	June.	July.
1							
2							
3					454		128
4							123
5		80					
6	26		148				
7		67					
8					432	180	
9						175	
10							
11	21						
12				843			
13			114		454		
14				1,020			
15						118	
16							
17	24						
18					350		
19							
20				729		110	
21							
22						110	
23							
24	24	312	77			295	
25							
26							
27		94			248		
28							
29							
30	23	65	62				
31					189		

NOTE.—Discharge determined from a fairly well defined rating curve.

McCLOUD RIVER AT BAIRD, CAL.

LOCATION.—In the NW. ¼ sec. 23, T. 34 N., R. 4 W., at United States fishery at Baird about 2 miles above junction with Pit River. Bailey Creek enters about 2,000 feet above and Johns Creek 2,000 feet below the station.

DRAINAGE AREA.—665 square miles.

RECORDS AVAILABLE.—December 22, 1910, to September 30, 1914.

GAGE.—Vertical staff fastened to an alder tree on right bank, 600 feet above the hatchery.

DISCHARGE MEASUREMENTS.—Made from cable 20 feet above gage.

CHANNEL AND CONTROL.—Gravel and cobblestones; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 13.3 feet January 2 (discharge, 24,500 second-feet); minimum stage recorded, 1.80 feet October 1 to November 4, November 8 to 17, November 22 to 24, and December 7 to 10 (discharge, 1,150 second-feet).

1910–1914: Maximum stage recorded, 13.3 feet January 2, 1914 (discharge, 24,500 second-feet); minimum discharge recorded, 1,100 second-feet October 17, 1910; a miscellaneous measurement.

ACCURACY.—Rating curve well defined; results excellent.

COOPERATION.—Gage-height record furnished by G. H. Lambson, superintendent of United States fishery.

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Discharge measurements of McCloud River at Baird, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 25	Charles Leidl	8.88	12,300	Sept. 14	Charles Leidl	2.19	1,350
25	do	9.82	14,400	14	do	2.19	1,400
July 7	H. J. Tompkins	2.80	1,900				

Daily discharge, in second-feet, of McCloud River at Baird, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,150	1,150	1,480	12,000	2,820	3,780	4,050	3,160	2,500	1,880	1,480	1,300
2	1,150	1,150	1,300	24,500	2,710	3,910	3,780	3,280	2,400	1,880	1,480	1,300
3	1,150	1,150	1,250	12,000	2,600	3,650	3,780	3,280	2,400	1,810	1,480	1,300
4	1,150	1,150	1,250	9,340	2,400	3,400	7,550	3,400	2,300	1,810	1,480	1,250
5	1,150	1,300	1,200	6,320	2,400	3,280	10,300	3,280	2,210	1,810	1,480	1,250
6	1,150	1,360	1,200	4,050	2,210	3,400	7,330	3,400	2,210	1,810	1,480	1,250
7	1,150	1,200	1,150	4,050	2,120	3,400	5,770	3,400	2,500	1,740	1,480	1,250
8	1,150	1,150	1,150	3,650	2,040	3,780	5,260	3,400	2,210	1,740	1,480	1,250
9	1,150	1,150	1,150	3,280	2,040	3,650	5,430	3,520	2,210	1,740	1,480	1,250
10	1,150	1,150	1,150	2,820	2,040	3,780	4,940	3,280	2,040	1,670	1,480	1,250
11	1,150	1,150	1,250	2,600	1,880	3,780	6,130	3,040	2,040	1,670	1,480	1,250
12	1,150	1,150	1,200	2,600	1,880	3,650	5,260	3,040	2,040	1,670	1,480	1,250
13	1,150	1,150	1,670	2,400	1,880	3,520	5,100	3,040	2,040	1,670	1,480	1,200
14	1,150	1,150	1,600	9,800	1,880	3,520	4,630	3,040	2,040	1,670	1,480	1,200
15	1,150	1,150	1,480	9,340	1,880	3,400	6,320	3,040	1,960	1,600	1,420	1,200
16	1,150	1,150	1,360	6,710	1,880	3,400	6,130	3,040	1,960	1,600	1,420	1,200
17	1,150	1,150	1,300	9,340	2,040	3,520	5,430	2,820	1,960	1,600	1,420	1,250
18	1,150	1,420	1,250	7,120	3,650	3,520	4,780	2,820	1,960	1,600	1,420	1,420
19	1,150	1,250	1,250	4,630	8,430	3,520	4,780	2,820	1,960	1,600	1,420	1,250
20	1,150	1,250	1,250	6,710	12,000	3,520	5,100	2,600	1,960	1,600	1,420	1,360
21	1,150	1,200	1,250	6,710	22,400	3,520	4,630	2,710	1,880	1,600	1,420	1,360
22	1,150	1,150	1,250	8,880	11,200	3,520	4,050	2,710	1,810	1,600	1,360	1,360
23	1,150	1,150	1,250	7,330	7,550	3,520	4,630	2,600	1,810	1,600	1,360	1,360
24	1,150	1,150	1,250	10,500	5,600	3,400	4,330	2,600	2,400	1,540	1,360	1,300
25	1,150	1,300	1,300	13,800	4,940	3,280	4,050	3,910	2,600	1,540	1,360	1,300
26	1,150	1,880	1,300	10,500	4,050	3,160	3,780	2,820	2,210	1,540	1,360	1,300
27	1,150	4,330	1,250	6,710	3,780	2,930	3,520	2,820	2,040	1,540	1,360	1,300
28	1,150	1,880	1,250	4,940	3,520	2,820	3,400	2,600	1,960	1,540	1,360	1,300
29	1,150	1,670	1,420	3,910	.....	3,160	3,280	2,500	1,960	1,540	1,360	1,300
30	1,150	1,480	2,040	3,400	.....	3,280	3,160	2,500	1,880	1,480	1,360	1,300
31	1,150	.....	23,600	3,160	.....	4,630	.....	2,400	.....	1,480	1,360	.....

NOTE.—Discharge determined from a well-defined rating curve.

Monthly discharge of McCloud River at Baird, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 665 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	1,150	1,150	1,150	1.73	1.99	70,700	B.
November	4,330	1,150	1,370	2.06	2.30	81,500	A.
December	23,600	1,150	2,030	3.05	3.52	125,000	A.
January	24,500	2,400	7,200	10.83	12.50	443,000	A.
February	22,400	1,880	4,420	6.65	6.92	245,000	A.
March	4,630	2,820	3,500	5.26	6.06	215,000	A.
April	10,300	3,160	5,020	7.55	8.42	299,000	A.
May	3,910	2,400	3,000	4.51	5.20	184,000	A.
June	2,600	1,810	2,120	3.19	3.56	126,000	A.
July	1,880	1,480	1,650	2.48	2.86	101,000	A.
August	1,480	1,360	1,430	2.15	2.48	87,900	A.
September	1,420	1,200	1,280	1.92	2.14	76,200	A.
The year	24,500	1,150	2,840	4.27	57.95	2,050,000	

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COW CREEK AT MILLVILLE, CAL.

LOCATION.—In the NW. ¼ sec. 14, T. 31 N., R. 3 W., at highway bridge at Millville. Clover Creek enters three-fourths of a mile below the station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 10, 1911, to March 31, 1914, when station was discontinued.

GAGE.—Vertical staff fastened to a large oak tree on right bank, 6 feet below bridge.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Gravel and small boulders; will shift during high water.

EXTREMES OF DISCHARGE.—1911–1914: Maximum stage recorded, 10.6 feet January 13, 1914 (discharge, 10,500 second-feet); minimum stage recorded, 0.68 foot from October 25 to 30, 1913 (discharge, 30 second-feet).

DIVERSIONS.—Several small ditches divert water for irrigation above the station.

ACCURACY.—Rating curve well defined to October 31, 1913. Protective work for the bridge piers in December, 1913, caused a change in the channel, and as no discharge measurements were made in the period December 19, 1913, to January, 12, 1914, estimates of discharge have not been prepared. Rating curve for period January 13 to March 31, 1914, fairly well defined by measurements in January; otherwise the results are good.

COOPERATION.—Gage-height record furnished by J. R. Douease.

Discharge measurements of Cow Creek at Millville, Cal., during the year ending Sept. 30, 1914.

[Made by Charles Leidl.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Jan. 20	3.21	679	Jan. 22	5.79	3,000
21	7.00	4,850			

Daily gage height, in feet, of Cow Creek at Millville, Cal., for the year ending Sept. 30, 1914.

[J. R. Douease, observer.]

Day.	Oct.	Dec.	Jan.	Feb.	Mar.	Day.	Oct.	Dec.	Jan.	Feb.	Mar.
1	0.88	.....	4.9	2.3	2.3	16	0.70	.....	5.2	1.50	1.60
2	.88	.....	10.6	2.1	2.3	17	.72	.....	5.3	1.50	1.50
3	.88	.....	4.6	2.0	2.3	18	.72	.....	4.0	1.60	1.50
4	.85	.....	3.6	2.0	2.3	19	.75	1.00	3.0	4.0	1.50
5	.82	.....	2.6	1.90	2.2	20	.75	1.00	7.0	5.0	1.50
6	.85	.....	3.0	1.80	2.2	21	.72	1.00	5.9	5.5	1.50
7	.82	.....	4.6	1.70	2.2	22	.72	5.0	4.5	4.5	1.50
8	.82	.....	2.6	1.70	2.0	23	.70	2.7	5.8	4.5	1.50
9	.85	.....	2.0	1.60	1.80	24	.70	4.0	5.1	3.6	1.50
10	.88	.....	2.0	1.60	1.80	25	.68	7.0	5.0	3.5	1.50
11	.80	.....	2.2	1.60	1.70	26	.68	2.7	4.0	2.9	1.50
12	.85	.....	3.4	1.50	1.70	27	.68	1.7	3.3	2.8	1.50
13	.85	.....	10.6	1.50	1.70	28	.68	1.5	3.0	2.4	1.50
14	.85	.....	4.6	1.50	1.70	29	.68	2.0	2.8	.....	1.60
15	.75	.....	3.3	1.50	1.60	30	.68	10.0	2.5	.....	1.60
						31	.70	10.0	2.5	.....	1.60

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Daily discharge, in second-feet, of Cow Creek at Millville, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Jan.	Feb.	Mar.	Day.	Oct.	Jan.	Feb.	Mar.
1	45	.....	263	263	16	31	2,400	78	92
2	45	.....	205	263	17	32	2,510	78	78
3	45	.....	178	263	18	32	1,250	92	78
4	42	.....	178	263	19	34	560	1,250	78
5	40	.....	153	233	20	34	4,750	2,180	78
6	42	.....	130	233	21	32	3,240	2,740	78
7	40	.....	110	233	22	32	1,690	1,690	78
8	40	.....	110	178	23	31	3,110	1,690	78
9	42	.....	92	130	24	31	2,290	945	78
10	45	.....	92	130	25	30	2,180	870	78
11	38	.....	92	110	26	30	1,250	510	78
12	42	.....	78	110	27	30	735	460	78
13	42	10,500	78	110	28	30	560	295	78
14	42	1,780	78	110	29	30	460	.....	92
15	34	735	78	92	30	30	330	.....	92
					31	31	330	.....	92

NOTE.—Discharge determined from two fairly well defined rating curves.

Monthly discharge of Cow Creek at Millville, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	45	30	36.3	2,230	C.
January 13–31	10,500	330	2,140	80,600	C.
February	2,740	78	528	29,300	D.
March	263	78	130	7,990	D.

CLOVER CREEK AT MILLVILLE, CAL.

LOCATION.—In the SE. ¼ sec. 10, T. 31 N., R. 3 W., at highway bridge at Millville, one-fourth mile above junction with Cow Creek.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 10, 1911, to January 15, 1914, when station was discontinued.

GAGE.—Vertical staff on downstream end of bridge pier near left bank.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Sand and gravel; fairly permanent.

EXTREMES OF DISCHARGE.—1911–1914: Maximum stage recorded, 9.6 feet at 5 p. m. January 21, 1914 (approximate discharge, determined from extension of rating curve, 5,150 second-feet); minimum stage recorded, 1.70 feet from October 6 to 23, 1913 (discharge, 2 second-feet).

DIVERSIONS.—Water is diverted for irrigation above the station.

ACCURACY.—Rating curve well defined; results excellent for stages less than 1,200 second-feet; at higher stages rating curve is not defined. Estimates somewhat uncertain for period after the flood January 2, 1914.

COOPERATION.—Gage-height record furnished by H. H. Butzbach.

The following discharge measurement was made by Charles Leidl:
January 20, 1914: Gage height, 4.86 feet; discharge, 606 second-feet.

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ily discharge, in second-feet, of Clover Creek at Millville, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Day.	Oct.	Nov.	Dec.	Jan.
.....	.....	75	.....	2,950	16.....	.....	.....	.....	.....
.....	.....	42	.....	4,290	17.....	.....	.....	.....	.....
.....	.....	24	.....	2,250	18.....	.....	367	24	.....
.....	.....	17	.....	.....	19.....	.....	348	32	.....
.....	.....	24	.....	.....	20.....	.....	.....	54	.....
.....	2	348	.....	.....	21.....	.....	.....	114	.....
.....	.....	.....	.....	995	22.....	.....	910	910	.....
.....	.....	.....	.....	.....	23.....	2	.....	.....	.....
.....	.....	.....	.....	.....	24.....	.....	.....	1,300	.....
.....	.....	24	.....	.....	25.....	.....	.....	2,010	.....
.....	.....	.....	472	.....	26.....	.....	.....	386	.....
.....	.....	32	.....	685	27.....	.....	386	249	.....
.....	.....	24	.....	425	28.....	.....	.....	114	.....
.....	.....	.....	.....	1,780	29.....	.....	386	280	.....
.....	.....	.....	.....	865	30.....	.....	68	2,280	.....
					31.....	.....	.....	3,150	.....

LITTLE COW CREEK AT PALO CEDRO, CAL.

LOCATION.—In the SE. ¼ sec. 5, T. 31 N., R. 3 W., at highway bridge, one-fourth mile east of Palo Cedro, and one-fourth mile above junction with Cow Creek.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 9, 1911, to January 31, 1914, when station was discontinued.

GAGE.—Vertical staff on bridge pier near right bank.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading above gage.

CHANNEL AND CONTROL.—Gravel and small boulders; shifts during high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 13.5 feet December 31 (data insufficient for determination of discharge); minimum stage, 0.8 foot October 10–11 (discharge, 3 second-feet; record for year incomplete).

1911–1914: Maximum stage recorded, 13.5 feet December 31, 1913 (discharge not determined; stage November 6, 1912; 10.0 feet; discharge, 4,480 second-feet); minimum stage, 0.75 foot July 22, 1913 (discharge, 2 second-feet).

DIVERSIONS.—A small amount of water is pumped from this stream for irrigation. The Terry Lumber Co.'s flume, which is supplied by a diversion from Montgomery Creek, discharges into this stream from June to December 8 or 10 second-feet and for the remainder of the year about 6 second-feet.

ACCURACY.—Rating curve well defined below 500 second-feet; results fair.

COOPERATION.—Gage-height record furnished by Richmond Logan.

The following discharge measurement was made by Charles Leidl:

January 20, 1914: Gage height, 6.05 feet; discharge, 2,270 second-feet.

ily gage height, in feet, of Little Cow Creek at Palo Cedro, Cal., for the year ending Sept. 30, 1914.

[Richmond Logan, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Day.	Oct.	Nov.	Dec.	Jan.
1.....	0.9	.....	2.4	.....	16.....	.....	2.3	.....	.....
2.....	.9	1.0	.....	.....	17.....	.....	.....	.....	.....
3.....	.....	.....	2.4	.....	18.....	0.9	.....	.....	.....
4.....	.9	.....	.....	.....	19.....	.....	1.6	.....	.....
5.....	.....	1.0	1.6	.....	20.....	.....	.....	2.0	6.0
6.....	.....	3.0	.....	.....	21.....	.....	.....	.....	.....
7.....	.9	.....	.....	.....	22.....	.9	1.8	4.1	.....
8.....	.....	.....	.....	.....	23.....	.9	.....	.....	.....
9.....	.....	2.0	.....	.....	24.....	.....	2.0	.....	.....
10.....	.8	.....	.....	.....	25.....	.9	.....	8.0	.....
11.....	.8	1.6	.....	.....	26.....	.....	.....	.....	.....
12.....	.9	.....	.....	.....	27.....	.....	2.4	.....	.....
13.....	.....	.....	.....	.....	28.....	.....	.....	.....	.....
14.....	.9	.....	.....	.....	29.....	.....	2.6	8.0	.....
15.....	.....	2.2	2.1	.....	30.....	.....	.....	13.0	.....
					31.....	.....	.....	13.5	7.35

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Daily discharge, in second-feet, of Little Cow Creek at Palo Cedro, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	7	.....	164	11	3	54	.....	21	.....	.....	.....
2	7	12	.....	12	7	.....	.....	22	7	74	715
3	.....	.....	164	13	.....	.....	.....	23	7	.....	.....
4	7	.....	.....	14	7	.....	.....	24	.....	100	.....
5	.....	12	54	15	.....	130	114	25	7	.....	3,150
6	.....	302	.....	16	.....	146	.....	26	.....	.....	.....
7	7	.....	.....	17	.....	.....	.....	27	.....	164	.....
8	.....	.....	.....	18	7	.....	.....	28	.....	.....	.....
9	.....	100	.....	19	.....	54	.....	29	.....	202	3,150
10	3	.....	.....	20	.....	.....	100	30	.....	.....	.....
								31	.....	.....	.....

NOTE.—Discharge determined from a fairly well defined rating curve. No estimates made after Dec. 29.

BEAR CREEK NEAR MILLVILLE, CAL.

LOCATION.—In sec. 36, T. 31 N., R. 3 W., at highway bridge, 4 miles southeast of Millville, and 5 miles above junction with Sacramento River.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 19, 1911, to March 31, 1914, when station was discontinued.

GAGE.—Vertical staff in two sections fastened to alder tree on left bank, 400 feet above bridge and above influence of small rock and brush dam at bridge.

DISCHARGE MEASUREMENTS.—Made by wading above the gage, except at high stages, when measurements are made from the bridge.

CHANNEL AND CONTROL.—Small boulders; rough.

EXTREMES OF STAGE.—Maximum stage recorded during year, 8.4 feet January 25; minimum stage recorded, 1.1 feet October 1 (discharge, 7 second-feet).

1911–1914: Maximum stage recorded, 8.4 feet January 25, 1914; minimum stage recorded, 0.9 foot August 21, 1913 (discharge, 4 second-feet).

DIVERSIONS.—A small amount of water is diverted into the drainage basin of Bear Creek from the headwaters of Hat Creek and is used for power development.

ACCURACY.—Rating curve well defined for low and medium stages. No estimates prepared December 24, 1913, to March 31, 1914, as sufficient discharge measurements were not made to cover the range of stage and changes in the channel.

The following discharge measurement was made by Charles Leidl:

January 21, 1914: Gage height, 6.70 feet; discharge, 2,860 second-feet.

Daily gage height, in feet, of Bear Creek near Millville, Cal., for the year ending Sept 30, 1914.

[Fred Dersch, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	1.1	1.3	4.0	4.1	4.8	3.2	16	.....	1.4	3.1	6.3	3.7	.....
2	1.1	1.3	3.9	.....	.....	.....	17	.....	1.35	3.1	6.4	3.5	3.0
3	.....	.....	.....	4.6	4.8	3.2	18	.....	.....	3.0	.....	.....	3.0
4	1.1	.....	3.8	4.7	4.6	.....	19	.....	.....	.....	.....	3.5	2.9
5	.....	.....	.....	4.7	4.6	3.2	20	1.2	1.4	.....	.....	3.5	.....
6	.....	1.3	.....	.....	.....	3.1	21	.....	.....	4.1	6.7	3.5	2.8
7	.....	.....	.....	.....	.....	3.1	22	1.25	.....	.....	.....	.....	2.8
8	.....	1.35	3.5	6.9	4.1	3.1	23	.....	.....	4.3	.....	3.4	2.7
9	.....	.....	.....	.....	.....	.....	24	.....	.....	7.6	7.3	3.4	2.7
10	.....	1.3	4.0	7.4	3.8	3.1	25	1.22	1.6	6.8	8.4	3.4	2.7
11	.....	.....	4.6	.....	3.8	3.0	26	.....	.....	.....	.....	.....	2.6
12	1.2	.....	.....	.....	.....	3.0	27	1.2	1.8	5.4	6 5	.....	2.6
13	1.22	1.3	4.6	7.6	.....	3.0	28	.....	2.6	.....	5.4	3.2	2.5
14	.....	.....	3.0	7.7	3.7	3.0	29	.....	4.2	6.1	5.4	.....	.....
15	1.22	.....	.....	6.4	3.7	.....	30	.....	3.4	10.1	.....	.....	2.5
							31	.....	.....	12.0	.....	.....	2.5

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Daily discharge, in second-feet, of Bear Creek near Millville, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	7	12	313	11			419	21			330
2	7	12	296	12	9			22	10		
3				13	9.6	12	419	23			365
4	7		279	14			156	24			
5				15	9.6			25	9.6	25	
6		12		16		16	170	26			
7				17		14	170	27	9	36	
8		14	231	18			156	28		106	
9				19				29		347	
10		12	313	20	9	16		30		215	
								31			

NOTE.—Discharge determined from a wel.-defined rating curve. No estimates made after Dec. 23.

NORTH FORK OF COTTONWOOD CREEK AT ONO, CAL.

LOCATION.—Near the center of sec. 11, T. 30 N., R. 7 W., at highway bridge, one-fourth mile southwest of Ono. Byron Creek enters 250 feet above and Eagle Creek half a mile below the station.

DRAINAGE AREA.—52 square miles.

RECORDS AVAILABLE.—October 27, 1907, to December 31, 1913, when station was discontinued.

GAGE.—Vertical staff on left face of middle pier of bridge.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Gravel and small boulders; subject to slight change during high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 9.0 feet December 31 (discharge, 4,180 second-feet); minimum stage, 3.95 feet October 1 to 23 (discharge, 1 second-foot).

1907–1914: Maximum stage recorded, 9.0 feet December 31, 1913 (discharge, 4,180 second-feet); minimum stage recorded, 3.9 feet during parts of August and September, 1913 (discharge, 1 second-foot).

DIVERSIONS.—Several small ditches divert water from this stream above the station.

ACCURACY.—Rating curve is fairly well defined and results are good.

COOPERATION.—Gage-height record furnished by F. J. Wheelock.

The following discharge measurement was made by Charles Leidl:

January 23, 1914: Discharge, 782 second-feet.

Daily discharge, in second-feet, of North Fork of Cottonwood Creek at Ono, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1				11				21			
2				12				22			
3				13				23	1		
4		9		14				24			
5				15				25			
6		38		16				26			
7				17				27			
8				18				28			
9				19			70	29			
10		13		20				30			1,990
								31			4,180

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DEER CREEK NEAR VINA, CAL.

LOCATION.—In the NW. ¼ sec. 23, T. 25 N., R. 1 W., 2½ miles northeast of Roberts ranch house, about 9½ miles northeast of Vina.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 17, 1911, to September 30, 1914.

GAGE.—Vertical staff fastened to a sycamore tree on left bank, one-fourth mile above site of old sheep bridge. Observer, David Roberts.

DISCHARGE MEASUREMENTS.—Made from cable 100 feet below gage or by wading.

CHANNEL AND CONTROL.—Gravel and small boulders; shifts during extremely high water.

EXTREMES OF DISCHARGE.—1911–1914: Maximum stage recorded, 11.0 feet December 31, 1913 (discharge, 6,920 second-feet); minimum stage recorded, 2.02 feet during most of September and October, 1913 (discharge, 92 second-feet.)

ACCURACY.—Rating curves well defined; results excellent except during flood stages.

COOPERATION.—Station maintained in cooperation with Oro Electric Corporation.

Discharge measurements of Deer Creek near Vina, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 26	R. C. Rice	6.70	2,760	Sept. 11	Charles Leidl	2.02	115
26	do	6.70	2,810				

Daily discharge, in second-feet, of Deer Creek near Vina, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	92	97	152	2,850	595	640	482	690	a 380	a 188	128	116
2	a 92	142	135	4,850	528	640	460	690	380	185	a 128	a 116
3	92	105	127	2,350	482	a 606	482	790	a 366	185	a 128	a 116
4	92	103	124	1,310	420	572	690	840	a 351	a 181	a 128	a 116
5	92	105	118	950	400	572	1,010	840	a 336	a 176	128	116
6	a 92	127	115	740	360	595	840	790	322	172	a 126	a 118
7	93	127	113	840	340	640	790	790	420	a 171	125	a 119
8	95	104	112	840	322	690	790	790	380	a 168	125	121
9	a 95	100	109	690	305	690	950	790	a 334	a 167	a 125	a 119
10	95	100	106	595	288	690	1,520	740	288	165	125	a 117
11	94	104	126	482	288	690	1,310	690	270	165	a 125	115
12	93	118	124	1,190	288	690	1,070	640	a 262	160	125	a 115
13	93	115	433	950	288	740	950	640	255	158	a 124	115
14	a 93	116	220	6,000	270	690	1,070	640	a 248	a 157	122	115
15	93	106	169	2,350	270	690	1,190	690	240	156	a 120	115
16	a 92	103	148	1,310	270	690	1,380	a 642	240	a 152	118	a 115
17	92	103	142	2,510	305	740	1,130	595	a 235	147	a 118	a 115
18	92	490	133	2,190	1,870	790	1,070	595	a 230	145	a 118	115
19	92	161	127	1,380	2,030	840	1,130	572	225	a 145	118	a 115
20	a 92	127	127	1,130	5,790	840	1,250	a 555	225	145	a 118	115
21	92	129	148	1,590	4,350	840	1,190	a 538	210	a 145	118	115
22	a 92	113	1,820	2,350	2,430	840	1,070	a 522	210	145	118	a 115
23	a 92	112	452	1,660	1,660	840	950	505	205	a 143	a 118	115
24	a 92	105	1,220	3,210	1,190	840	840	505	305	141	118	a 114
25	92	148	2,840	3,660	1,070	790	790	a 482	255	139	a 117	112
26	a 92	158	700	2,850	840	740	740	460	225	a 138	116	a 112
27	92	656	361	1,870	740	640	740	a 440	210	a 136	a 116	112
28	a 92	220	a 290	1,310	690	595	690	a 420	a 201	a 134	116	112
29	92	344	220	950	.....	640	640	a 400	192	133	a 116	a 112
30	92	181	1,750	790	.....	572	640	380	190	a 130	a 116	112
31	93	.....	6,920	690	.....	550	.....	a 380	.....	128	116	.....

a Interpolated.

NOTE.—Discharge determined from two well-defined rating curves, applicable Oct. 1 to Dec. 31 and Jan. 1 to Sept. 30.

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Monthly discharge of Deer Creek near Vina, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	95	92	92.5	5,690	A.
November	656	97	161	9,580	A.
December	6,920	106	635	39,000	C.
January	6,000	482	1,820	112,000	C.
February	5,790	270	1,020	56,600	C.
March	840	550	697	42,900	A.
April	1,520	460	928	55,200	A.
May	840	380	614	37,800	A.
June	420	190	273	16,200	A.
July	188	128	155	9,530	A.
August	128	116	121	7,440	A.
September	121	112	115	6,840	A.
The year	6,920	92	551	399,000	

STONY CREEK NEAR STONYFORD, CAL.

LOCATION.—In the E. ½ sec. 35, T. 18 N., R. 7 W., 3½ miles from Stonyford.

DRAINAGE AREA.—97 square miles (measured by U. S. Reclamation Service).

RECORDS AVAILABLE.—April 1 to December 31, 1913 (monthly estimates), and January 1 to September 30, 1914.

GAGE.—Vertical staff fastened to rock.

DISCHARGE MEASUREMENTS.—Made from cable 50 feet below gage.

CHANNEL AND CONTROL.—Bed composed of thin deposit of gravel; fairly permanent.

EXTREMES OF DISCHARGE.—1913–1914: Maximum stage recorded January 2, 1914 (discharge, 5,350 second-feet); minimum discharge, 20 second-feet during parts of September and October, 1913.

ACCURACY.—Maximum discharge computed from cross-section measurements and slope of water surface. Rating curve defined by current-meter measurements below 5,000 second-feet.

COOPERATION.—Complete data furnished by United States Reclamation Service.

Daily discharge, in second-feet, of Stony Creek, near Stonyford, Cal., for the year ending Sept. 30, 1914.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3,350	575	620	275	210	197	82	47	32
2	5,350	515	575	282	232	187	82	47	32
3	2,100	455	513	350	275	187	80	45	32
4	1,350	430	497	497	270	187	75	44	32
5	910	425	497	635	267	172	75	43	32
6	725	385	497	510	267	160	72	43	32
7	900	360	497	440	232	155	70	42	32
8	710	360	497	402	267	150	68	42	32
9	560	345	505	512	250	132	67	43	32
10	452	330	497	655	232	132	66	44	31
11	400	330	497	550	212	130	65	44	31
12	387	322	485	460	237	127	63	45	31
13	597	312	452	470	232	125	60	45	31
14	4,000	307	440	497	260	122	60	45	31
15	1,350	307	425	577	267	122	57	45	30
16	845	305	425	497	237	122	55	45	30
17	1,320	495	425	425	212	127	55	43	30
18	925	1,220	432	395	212	123	55	43	30
19	685	1,010	440	407	222	117	57	43	30
20	665	5,100	432	425	232	115	57	39	30
21	2,420	2,770	425	395	232	110	55	37	30
22	3,900	1,400	425	350	237	102	55	37	30
23	1,950	1,060	425	312	250	97	52	35	30
24	3,350	845	390	282	232	115	47	35	30
25	3,350	800	370	268	220	110	45	33	31
26	2,250	710	330	250	197	100	47	32	30
27	1,400	620	280	250	187	115	50	32	30
28	975	580	275	232	187	110	50	32	30
29	845	.....	350	215	187	85	49	32	30
30	685	.....	267	210	187	82	47	32	30
31	620	.....	267	.....	192	.....	47	32	.....

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Monthly discharge of Stony Creek near Stonyford, Cal., for the years ending Sept. 30, 1913–14.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
1913.				
April	221	164	201	12,000
May	192	140	165	10,100
June	117	65	87	5,180
July	52	36	44	2,700
August	34	24	29	1,780
September	24	20	22	1,310
The period				33,100
1914.				
October	21	20	21.0	1,290
November	300	29	58.0	3,450
December	5,000	41	391	24,000
January	5,350	387	1,590	97,800
February	5,100	305	810	45,000
March	620	267	434	26,700
April	655	210	401	23,900
May	282	187	232	14,300
June	197	82	130	7,740
July	82	45	60.2	3,700
August	47	32	40.2	2,470
September	32	30	30.8	1,830
The year	5,350	20	348	252,000

NOTE.—Maximum, minimum, and mean discharge furnished by U. S. Reclamation Service; run-off computed by engineers of U. S. Geological Survey.

LITTLE STONY CREEK NEAR LODOGA, CAL.

LOCATION.—At East Park reservoir, 4 miles above junction with Stony Creek and 3½ miles northwest of Lodoga.

DRAINAGE AREA.—102 square miles.

RECORDS AVAILABLE.—January 1, 1908, to September 30, 1914.

GAGE.—Record beginning December 1, 1910, taken from gage at the dam; prior to this date the station was maintained a short distance below the present site.

DISCHARGE.—Computed from gage readings at the dam. Correction has been made for evaporation, which is determined from records obtained from an evaporation pan at the reservoir. When the flow is 10 second-feet or less, the discharge is computed from weir and currer t-meter measurements taken at the head of the reservoir about 3 miles above the dam.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, December 31 (discharge, 3,380 second-feet); channel dry November 6 to 8 and 25, and August 23 to September 30.

1907–1914: Maximum stage recorded, 11.8 feet, February 2, 1909 (discharge, 7,060 second-feet); channel dry during part of every year.

ACCURACY.—Considerable care is used in collecting these data and results are good.

COOPERATION.—Record furnished by United States Reclamation Service, through A. N. Burch, project manager.

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discharge, in second-feet, of Little Stony Creek near Lodoga, Cal., for the year ending Sept. 30, 1914.

y.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
.....	2.0	1.0	15	3,140	680	275	87	71	24	2.4	1.0
.....	2.0	1.0	10	1,510	626	254	107	46	18	2.4	1.0
.....	1.0	2.0	10	1,300	597	244	100	37	17	2.4	.1
.....	2.0	1.0	10	764	211	222	160	52	23	2.4	.1
.....	2.0	1.0	11	782	233	231	157	52	26	2.2	.1
.....	1.0	.0	8	274	186	202	146	58	23	2.2	.1
.....	1.0	.0	6	310	161	192	130	45	22	2.2	.1
.....	2.0	.0	4	241	183	172	113	52	14	2.2	.1
.....	2.0	1.0	5	202	159	171	106	58	17	2.2	.1
.....	1.0	1.0	7	182	155	159	122	57	17	2.2	.1
.....	1.0	1.0	5	165	105	154	126	52	17	2.2	.1
.....	1.0	2.0	6	154	128	150	128	55	14	1.5	.1
.....	2.0	2.0	5	1,140	153	140	103	58	17	1.5	.1
.....	2.0	3.0	2	2,150	81	132	103	56	17	1.5	.1
.....	2.0	2.0	2	2,200	135	134	99	38	17	1.5	.1
.....	1.0	2.0	4	630	114	134	114	41	16	1.5	.05
.....	1.0	1.0	17	1,310	140	115	114	47	15	1.5	.05
.....	1.0	11	15	1,610	116	128	106	44	10	1.5	.05
.....	1.0	24	19	1,050	612	128	106	33	13	1.3	.05
.....	1.0	13	22	656	787	106	90	39	10	1.3	.05
.....	1.0	5.0	25	1,500	2,260	116	87	30	11	1.3	.05
.....	1.0	3.0	511	2,910	1,280	105	108	27	7	1.3	.05
.....	1.0	1.0	219	1,640	647	103	102	12	5	1.3	.0
.....	2.0	1.0	134	1,890	458	105	105	22	7	1.3	.0
.....	1.0	.0	1,850	1,640	391	102	93	18	6	1.3	.0
.....	1.0	1.0	754	2,020	306	108	97	21	5	1.0	.0
.....	1.0	134	208	1,500	276	107	89	27	3	1.0	.0
.....	1.0	50	163	1,010	267	107	89	24	2	1.0	.0
.....	1.0	25	88	920	.....	93	83	27	2.4	1.0	.0
.....	1.0	19	180	751	.....	125	70	21	2.4	1.0	.0
.....	1.0	.....	3,380	695	.....	116	.....	27	.....	1.0	.0

thly discharge of Little Stony Creek near Lodoga, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 102 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
r.....	2.0	1.0	1.32	0.013	0.01	81
ıber.....	134	.0	10.3	.101	.11	613
ber.....	3,380	2	248	.243	2.80	15,200
y.....	3,140	154	1,170	11.5	13.26	71,900
ıry.....	2,260	81	409	4.01	4.18	22,700
.....	275	93	149	1.46	1.68	9,160
.....	160	70	108	1.06	1.18	6,430
.....	71	12	40.2	.394	.45	2,470
.....	26	2	13.3	.130	.14	791
.....	2.4	1.0	1.63	.016	.02	100
.....	1.0	.0	.118	.0012	.00	7
ber.....	.0	.0	.000	.000	.00	0
he year.....	3,380	.0	179	1.75	23.83	129,000

.—Monthly and yearly discharge computed by engineers of U. S. Geological Survey.

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NORTH FORK OF FEATHER RIVER NEAR PRATTVILLE, CAL.

LOCATION.—Below the Great Western Power Co.'s dam at Big Meadows, 4,200 feet downstream from north boundary of sec. 28, T. 27 N., R. 8 E., about 5 miles southeast of Prattville and 4 miles above mouth of Butt Creek.

DRAINAGE AREA.—506 square miles above dam site.

RECORDS AVAILABLE.—June 13, 1905, to September 30, 1914.

GAGE.—July 31, 1912, to March 21, 1914, a Friez water-stage recorder on left bank 5 feet above vertical staff; datum of gage, 4,232.32 feet above sea level (United States Geological Survey datum). Original station, maintained June 13, 1905, to April 28, 1912, was 3,500 feet upstream from the present gage; on April 29, 1912, the station was moved downstream 1,300 feet. Original datum has not been maintained. Friez gage discontinued March 21, 1914.

DISCHARGE MEASUREMENTS.—Made from cable at gage. This section proved to be unsatisfactory on account of high velocities and roughness of channel. All discharge measurements made at this section have been discarded. The present rating curve was developed from current-meter gagings made during March, 1914, in flume 3,000 feet above the gage.

CHANNEL AND CONTROL.—Boulders; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, May 31 (discharge, 2,080 second-feet); minimum stage recorded, April 15–16, dry (water stored).

1905–1914: Maximum stage recorded, 16.2 feet March 19, 1907 (discharge, 10,000 second-feet); minimum stage recorded, April 15–16, 1914, dry (water stored).

REGULATION.—Beginning March 7, 1914, the record shows the quantity of water released from Big Meadows reservoir.

ACCURACY.—Rating curve is well defined and results are believed to be excellent.

COOPERATION.—Estimates of daily discharge furnished by Great Western Power Co., through L. P. Cornell, engineer.

Discharge measurements of North Fork of Feather River near Prattville, Cal., during the year ending September 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 1	F. H. Lathrop	6.75	1,420	19	R. F. Krafft	8.15	1,860
2	do	6.60	1,360	20	do	7.90	1,830
2	do	6.60	1,390	20	do	7.65	1,710
3	do	6.60	1,400	20	do	6.60	1,360
3	do	6.60	1,400	23	do	8.00	1,800
4	do	1.70	211	23	do	7.85	1,750
4	do	2.60	370	23	do	7.75	1,700
4	do	3.50	557	23	do	6.70	1,400
4	do	4.20	745	23	do	6.40	1,310
4	do	4.70	869	24	do	2.05	285
4	do	5.20	987	24	do	2.85	438
4	do	5.80	1,160	24	do	4.10	720
4	do	6.30	1,300	24	do	5.05	927
4	do	6.75	1,440	24	do	7.05	1,520
11	do	7.40	1,670	26	F. H. Lathrop	4.50	808
11	do	7.10	1,550	26	do	4.10	705
11	do	6.75	1,450	26	do	3.20	494
11	do	6.00	1,220	26	do	2.00	236
11	do	5.50	1,080	28	do	5.00	929
12	do	4.80	902	28	do	4.50	837
12	do	4.10	744	30	do	5.15	983
12	do	3.30	532	30	do	5.00	942
12	do	2.40	332	30	do	4.75	871
16	R. F. Krafft	8.60	1,950	30	do	4.35	772
16	do	8.70	1,980	30	do	3.90	665
16	do	8.55	1,960	30	do	3.45	536
17	do	7.60	1,680	30	do	2.80	408
18	do	7.95	1,830				

NOTE.—Measurements referred to gage in the diversion flume used during construction of dam.

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Daily discharge, in second-feet, of North Fork of Feather River near Prattville, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	570	594	650	1,150	1,160	1,400	1,050	1,900	1,900	370	866	1,110
2	574	602	630	1,260	1,170	1,370	1,110	1,850	1,850	370	825	1,110
3	574	610	610	1,540	1,010	1,360	1,290	1,950	1,700	370	825	1,250
4	570	614	606	1,680	502	1,360	1,620	1,950	1,790	370	860	1,520
5	566	602	590	1,780	638	1,350	2,000	1,950	1,760	370	1,150	1,340
6	562	630	590	1,800	690	1,350	1,970	1,800	1,620	475	1,170	1,110
7	566	670	590	1,820	755	1,180	2,020	2,000	1,870	690	1,250	1,110
8	570	658	590	1,800	580	1,450	2,020	2,000	1,930	595	1,180	1,110
9	578	650	582	1,730	681	1,450	1,990	2,020	1,920	675	1,250	1,340
10	578	634	582	1,680	1,360	1,460	1,900	2,040	1,920	1,080	1,140	1,320
11	606	634	594	1,600	711	1,480	1,630	2,060	1,910	1,040	1,140	1,130
12	618	634	602	1,450	675	1,490	940	2,070	1,910	840	1,090	1,120
13	598	642	602	1,310	695	1,500	1,280	2,070	1,910	809	1,090	1,120
14	590	634	622	1,220	725	1,870	400	2,070	1,910	761	1,090	1,160
15	582	634	618	1,070	740	1,880	.....	2,030	1,910	1,030	1,090	1,160
16	582	630	610	945	738	1,910	.....	1,810	1,910	1,030	1,090	1,160
17	562	622	598	780	597	1,820	577	1,810	1,910	1,030	1,100	1,160
18	586	622	594	1,070	731	1,800	1,220	1,830	1,910	1,030	1,140	1,160
19	594	626	582	984	774	1,830	1,620	1,810	1,910	779	1,240	1,160
20	578	650	574	850	1,460	1,750	1,650	1,800	1,910	729	1,140	1,160
21	582	646	574	812	1,470	1,800	1,780	1,590	1,910	733	1,500	1,160
22	562	634	586	723	1,510	1,800	1,800	1,980	1,900	713	1,020	1,160
23	562	622	582	900	1,160	1,800	1,970	1,990	1,840	713	1,040	1,160
24	574	614	590	912	768	1,800	1,960	2,000	1,510	713	1,080	1,160
25	566	610	586	1,010	1,110	1,750	1,900	1,990	1,510	713	1,060	1,160
26	574	626	574	1,120	1,500	800	1,900	1,980	1,440	1,010	1,060	1,160
27	570	670	586	1,140	1,460	850	1,900	2,010	986	1,180	1,070	1,130
28	566	710	590	1,140	1,430	850	1,900	2,010	678	1,140	1,110	1,130
29	570	698	610	1,140	.....	900	1,900	2,020	370	1,140	1,110	1,130
30	570	670	630	1,140	.....	750	1,900	2,040	370	1,040	1,110	1,130
31	586	.....	826	1,160	.....	800	.....	2,080	.....	847	1,110	.....

NOTE.—Water shut off at Canyon dam during some part of each day, Jan. 17 and 22 and Feb. 3–19.

Monthly discharge of North Fork of Feather River near Prattville, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.				Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	Mean [a] stored in reservoir.	
October	618	562	577	.....	35,500
November	710	594	636	.....	37,800
December	826	574	605	.....	37,200
January	1,820	723	1,250	.....	76,900
February	1,510	502	957	.....	53,100
March	1,910	750	1,450	+ 715	89,200
April	2,020	0	1,510	+1,550	89,800
May	2,080	1,590	1,950	+1,110	120,000
June	1,930	370	1,660	+ 103	98,800
July	1,180	370	787	+ 111	48,400
August	1,250	825	1,100	− 417	67,600
September	1,520	1,110	1,180	− 525	70,200
The year	2,080	0	1,140	.....	824,000

[a] The discharge in this column added to that in the column of "Means" gives the estimated unregulated discharge.

NOTE.—Monthly and yearly discharge, except monthly "Mean stored in reservoir," computed by engineers of U. S. Geological Survey.

NORTH FORK OF FEATHER RIVER AT BIG BAR, CAL.

LOCATION.—In the NW. ¼ sec. 32, T. 23 N., R. 5 E., one-fourth mile above Big Bar station on Western Pacific Railway, and about 7 miles above intake of Great Western Power Co.'s power plant at Big Bend.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—February 24, 1911, to September 30, 1914.

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GAGE.—Bristol water-stage recorder. Original gage was a staff installed July, 1910, opposite the middle of Jesse Moore Bar. January 17, 1911, station was moved 300 feet upstream and the Bristol water-stage recorder was installed; gage datum 1,347.96 feet above sea level (United States Geological Survey datum). In November, 1912, the Bristol gage was moved upstream 130 feet; gage datum now 1,348.96 feet above sea level.

DISCHARGE MEASUREMENTS.—Made from cable 20 feet above gage.

CHANNEL AND CONTROL.—Solid rock, boulders, and gravel; practically permanent.

EXTREMES OF DISCHARGE.—1911–1914: Maximum stage recorded, January 1, 1914 (discharge, 35,000 second-feet; estimated by the Great Western Power Co.); minimum stage recorded, October 18, 1913 (discharge, 836 second-feet).

REGULATION.—Flow partly regulated by Big Meadows reservoir.

ACCURACY.—Rating curve fairly well defined; results are considered fair by company.

COOPERATION.—Estimates of daily discharge furnished by Great Western Power Co., through L. P. Cornell, engineer.

Discharge measurements of North Fork of Feather River at Big Bar, Cal., during the year ending Sept. 30, 1914.

[Made by R. F. Krafft.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Aug. 10	2.88	1,910	Sept. 10	3.84	2,530	Sept. 11	1.50	1,080
Sept. 9	2.73	1,780	Sept. 10	3.23	2,040			

NOTE.—All measurements referred to datum of gage at present site; elevation,, 1,348.96 feet.

Daily discharge in second-feet, of North Fork of Feather River at Big Bar, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	876	960	1,300	35,000	4,460	5,350	4,700	7,870	5,860	1,870	1,330	1,520
2	852	1,020	1,240	34,400	4,200	5,690	4,550	7,980	5,490	1,770	1,300	1,500
3	860	1,000	1,190	22,800	3,910	5,580	4,860	8,100	5,010	1,700	1,330	1,540
4	876	.....	1,100	11,800	3,810	5,140	7,250	8,780	4,730	1,660	1,300	1,670
5	860	.....	1,060	7,790	3,530	4,990	10,600	9,010	4,330	1,600	1,500	2,060
6	888	.....	1,050	6,350	3,240	5,690	10,200	8,650	3,990	1,600	1,730	1,520
7	888	.....	1,080	5,920	3,220	6,050	10,000	8,520	4,330	1,840	1,730	1,500
8	905	.....	1,080	6,050	3,190	6,550	9,620	9,050	4,260	1,730	1,710	1,530
9	900	1,000	.....	5,300	3,020	7,150	12,500	8,710	4,110	1,700	1,710	1,550
10	888	1,000	.....	4,540	3,500	7,500	16,000	8,200	3,930	2,100	1,740	1,570
11	872	1,080	.....	3,900	3,340	7,650	13,300	7,840	3,800	2,070	1,700	1,470
12	902	1,110	.....	3,750	3,210	7,510	10,300	7,930	3,750	1,830	1,640	1,500
13	905	1,140	.....	3,930	3,100	8,200	9,700	7,960	3,730	1,770	1,570	1,550
14	912	1,130	1,320	7,790	3,080	8,290	9,680	8,050	3,640	1,700	1,530	1,580
15	900	1,100	1,300	7,170	3,090	8,290	12,100	7,990	3,790	1,840	1,500	1,600
16	900	1,050	1,240	5,360	3,200	8,860	12,700	7,370	3,830	1,900	1,500	1,630
17	880	1,050	1,220	5,650	3,250	9,520	10,800	7,020	3,720	1,840	1,530	1,630
18	836	1,240	1,190	5,380	4,380	9,810	10,500	6,940	3,650	1,810	1,500	1,580
19	905	1,200	1,170	4,500	7,940	10,100	11,000	6,980	3,550	1,700	1,630	1,600
20	905	1,280	1,140	3,900	15,900	10,000	12,300	6,720	3,480	1,430	1,580	1,570
21	910	1,230	1,130	4,110	28,300	9,620	11,700	6,510	3,340	1,500	1,850	1,570
22	900	1,120	1,680	6,910	15,000	9,810	10,200	6,580	3,280	1,400	1,660	1,590
23	880	1,080	1,550	7,560	9,620	10,100	9,340	6,450	3,100	1,360	1,390	1,570
24	898	1,090	1,540	9,700	7,090	9,850	8,200	6,320	3,510	1,380	1,430	1,570
25	860	1,220	2,340	17,700	6,320	9,520	7,680	6,740	3,110	1,320	1,500	1,540
26	860	1,360	2,090	20,600	6,140	7,900	7,320	6,050	2,920	1,450	1,430	1,540
27	880	2,440	1,660	11,800	5,550	6,720	7,430	5,850	2,550	1,780	1,420	1,530
28	900	1,840	1,500	8,020	5,250	5,920	7,540	5,680	2,410	1,730	1,460	1,500
29	900	1,570	1,500	6,350	.....	5,550	7,650	5,620	2,150	1,680	1,500	1,530
30	900	1,420	2,860	5,500	.....	5,200	7,760	5,710	1,960	1,680	1,470	1,530
31	880	.....	22,000	4,870	.....	4,570	.....	5,790	.....	1,400	1,480	.....

NOTE.—Mean discharge Nov. 4–8 estimated by the U. S. Geological Survey at 1,080 second-feet, and Dec. 9–13 at 1,160 second-feet, no record having been obtained for these periods; discharge Dec. 31 estimated by *the Great Western Power Co.*

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Monthly discharge of North Fork of Feather River at Big Bar, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	912	836	885	54,400
November	2,440	960	1,200	71,400
December	22,000	1,050	2,040	125,000
January	35,000	3,750	9,500	584,000
February	28,300	3,020	6,070	337,000
March	10,100	4,570	7,510	462,000
April	16,000	4,550	9,580	570,000
May	9,050	5,620	7,320	450,000
June	5,860	1,960	3,710	221,000
July	2,100	1,320	1,680	103,000
August	1,850	1,300	1,540	94,700
September	2,060	1,470	1,580	94,000
The year	35,000	836	4,370	3,170,000

NOTE.—Monthly and yearly discharge computed by engineers of the U. S. Geological Survey. For amount of regulation at Big Meadows reservoir, see monthly discharge table for station near Prattville, p. 228.

FEATHER RIVER AT OROVILLE, CAL.

LOCATION.—In sec. 8, T. 19 N., R. 4 E., at highway bridge at Oroville, 6 miles below junction of North and Middle forks, and 30 miles above the mouth of Yuba River.

DRAINAGE AREA.—3,640 square miles.

RECORDS AVAILABLE.—January 1, 1902, to September 30, 1914.

GAGE.—Friez water-stage recorder on right bank 200 feet below bridge at same datum as United States Weather Bureau vertical staff, which is in two sections on pier of highway bridge near right bank. Observer, W. H. Henderson.

DISCHARGE MEASUREMENTS.—Made from cable 1,000 feet above bridge. At extremely low water measurements have been made from a boat about 1,000 feet below bridge.

CHANNEL AND CONTROL.—Boulders and gravel; shifts somewhat during high water.

EXTREMES OF DISCHARGE.—Maximum stage during year, from automatic gage record, 20.5 feet at 7 p. m. December 31 (approximate discharge, computed from extension of rating curve, 167,000 second-feet); minimum stage, —0.13 foot at 10 a. m. October 7 (discharge, 790 second-feet).

1902–1914: Maximum stage recorded, 39.3 feet March 19, 1907 (discharge, 187,000 second-feet); minimum stage, from automatic gage record, —0.13 foot at 10 a. m. October 7, 1913 (discharge, 790 second feet).

REGULATION.—The operation of the Big Bend plant of the Great Western Power Co. causes considerable fluctuation in stage, especially during extremely low water.

ACCURACY.—Rating curve well defined; results excellent.

The following discharge measurement was made by Charles Leidl:

June 23, 1914: Gage height, 4.29 feet; discharge, 5,270 second-feet.

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Daily discharge, in second-feet, of Feather River at Oroville, Cal., for the year ending Sept 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	1,040	1,220	2,030	95,800	14,600	15,800	11,400	14,600	12,400	3,170	1,760	1,710
2	1,020	1,710	1,760	91,000	13,000	17,000	10,400	15,800	11,400	3,050	1,760	1,660
3	1,020	1,260	1,660	56,100	11,400	16,400	10,900	18,100	10,400	2,870	1,800	1,710
4	1,020	1,410	1,580	32,300	10,400	15,800	15,800	19,300	9,580	2,690	1,710	1,800
5	980	1,290	1,450	22,800	9,180	15,800	25,300	20,600	9,580	2,630	1,660	2,240
6	1,000	1,580	1,450	17,500	8,450	16,400	23,600	19,300	8,110	2,570	1,890	1,960
7	980	1,530	1,450	16,400	8,110	17,500	22,000	19,300	9,180	2,630	1,980	1,940
8	1,040	1,450	1,370	17,500	8,110	19,300	22,000	20,600	8,800	2,630	1,980	1,800
9	1,060	1,260	1,370	14,700	7,490	19,900	27,000	19,900	7,790	2,520	1,890	1,800
10	1,060	1,140	1,260	12,000	7,490	20,600	41,500	18,700	7,490	2,870	2,090	1,940
11	1,060	1,260	1,580	9,180	7,790	20,600	32,300	17,500	7,190	3,170	1,940	1,940
12	1,040	1,760	1,710	9,580	7,190	20,600	26,200	17,500	6,910	2,810	1,940	1,710
13	1,060	1,620	2,180	11,400	7,190	22,000	25,300	17,500	6,910	2,570	1,800	1,760
14	1,040	1,660	2,130	35,000	7,190	22,000	23,600	18,100	6,630	2,400	1,840	1,840
15	1,020	1,530	1,980	26,200	7,490	22,000	29,600	18,100	6,630	2,290	1,940	1,800
16	1,040	1,330	1,840	17,500	7,490	22,000	32,300	17,000	6,910	2,460	1,980	1,800
17	1,040	1,330	1,760	18,100	7,490	23,600	27,000	15,800	6,910	2,340	2,030	1,800
18	1,040	1,710	1,660	19,900	12,400	23,600	25,300	15,800	6,630	2,290	1,890	1,840
19	980	1,940	1,530	15,800	27,000	25,300	25,300	15,200	6,370	2,240	1,890	1,840
20	1,040	1,800	1,530	12,400	46,500	25,300	28,700	14,600	6,370	2,130	1,980	1,800
21	1,060	1,840	1,580	15,200	76,600	24,400	27,000	15,200	6,110	1,940	1,840	1,800
22	1,040	1,660	5,410	35,900	45,500	23,600	23,600	15,800	6,110	1,890	2,180	1,800
23	1,060	1,490	4,330	29,600	34,100	24,400	22,000	15,200	5,870	1,840	1,710	1,800
24	1,040	1,370	4,830	44,500	25,300	22,800	19,300	14,600	6,630	1,890	1,660	1,800
25	1,000	1,410	17,000	65,100	21,200	21,100	18,100	15,800	6,110	1,840	1,660	1,800
26	980	1,710	7,490	66,200	19,300	19,500	17,000	13,500	5,410	1,710	1,710	2,030
27	1,020	4,330	4,260	39,500	17,000	17,900	16,400	12,400	5,010	1,980	1,660	1,940
28	1,000	3,360	3,230	27,000	15,800	16,200	15,800	12,400	4,100	2,080	1,620	1,940
29	1,060	2,750	2,870	20,600	.....	14,600	14,600	11,900	3,750	2,130	1,710	1,800
30	980	2,400	8,110	18,100	.....	13,500	14,100	11,900	3,300	2,180	1,620	1,800
31	980	.....	121,000	15,800	.....	11,400	.....	12,400	.....	2,080	1,710	.....

NOTE.—Discharge determined from a well defined rating curve. No record, discharge interpolated Jan. 9 and 10, Mar. 24–28, and Aug. 16.

Monthly discharge of Feather River at Oroville, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	1,060	980	1,030	0.253	0.33	63,300	A.
November	4,330	1,140	1,740	.478	.53	104,000	A.
December	121,000	1,260	6,880	1.89	2.18	423,000	A.
January	95,800	9,180	30,000	8.24	9.50	1,840,000	B.
February	76,600	7,190	17,500	4.81	5.01	972,000	A.
March	25,300	11,400	19,700	5.41	6.24	1,210,000	A.
April	41,500	10,400	22,400	6.15	6.86	1,330,000	A.
May	20,600	11,900	16,300	4.48	5.16	1,000,000	A.
June	12,400	3,300	7,150	1.96	2.19	425,000	A.
July	3,170	1,710	2,380	.654	.75	146,000	A.
August	2,180	1,620	1,830	.503	.58	113,000	A.
September	2,240	1,660	1,840	.505	.56	109,000	A.
The year	121,000	980	10,700	.....	.....	7,740,000	

BUTT CREEK AT BUTTE VALLEY, CAL.

LOCATION.—100 feet below footbridge, 2 miles above junction with North Fork of Feather River, 1,000 feet above the intake to the Great Western Power Co.'s diversion flume, and about one-fourth mile south of Butte Valley post office.

DRAINAGE AREA.—73 square miles at original station.

RECORDS AVAILABLE.—June 14, 1905, to September 30, 1914.

GAGE.—Vertical staff on left bank, installed July 19, 1912, seven-eighths of a mile upstream from original vertical staff, which was on right bank; this gage is out of the influence of the low-water diversion dam near the flume intake of the Great Western Power Co.'s Butt Creek plant.

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ISCHARGE MEASUREMENTS.—Made from footbridge at gage.

HANNEL AND CONTROL.—Sand, gravel, and clay; apparently permanent.

XTREMES OF DISCHARGE.—Maximum stage recorded during year, 7.5 feet January 1 (discharge, 697 second-feet); minimum stage recorded, 1.30 feet December 18 (discharge, 28 second-feet).

1905–1914: Maximum stage recorded, 8.9 feet January 16, 1909 (discharge, 1,640 second-feet); minimum stage recorded, 2.0 feet August 4 to 8, 1908 (discharge, 21 second-feet).

DIVERSIONS.—Water is diverted from Butt Creek above the station into Yellow Creek drainage basin through Wallack ditch by the Oro Light & Power Co. The ditch has a capacity of 15 to 20 second-feet. Pending litigation with the Great Western Power Co., only a small quantity of water is diverted. No other diversions above station.

COOPERATION.—Station maintained and data furnished by Great Western Power Co., through L. P. Cornell, engineer.

Discharge measurements of Butt Creek at Butte Valley, Cal., during the year ending Sept. 30, 1914.

[Made by Great Western Power Co.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Oct. 23	1.31	28	Dec. 2	1.38	31	June 23	2.23	83
Nov. 15	1.40	34	12	1.45	42	July 25	1.55	55
15	1.40	34	Jan. 29	3.02	213	Aug. 18	1.50	45
23	1.41	36	Apr. 27	4.33	406			

Daily discharge, in second-feet, of Butt Creek at Butte Valley, Cal., for the year ending Sept. 30, 1914.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	29	37	43	697	162	159	213	325	219	84	54	46
2	29	52	40	633	167	164	198	351	213	84	54	46
3	29	35	44	470	165	154	178	386	198	79	54	46
4	29	37	53	303	162	150	317	403	188	76	53	47
5	29	41	50	205	151	174	418	397	170	74	53	47
6	29	52	43	167	137	179	375	393	176	73	53	47
7	30	44	41	170	133	205	362	384	186	71	52	47
8	30	37	40	174	112	221	357	393	184	69	52	48
9	30	32	44	135	105	241	397	386	158	68	52	48
0	30	35	46	136	90	259	359	366	143	68	52	47
1	30	37	44	107	94	266	432	347	136	68	52	46
2	31	47	44	90	101	276	513	338	132	67	52	46
3	31	50	58	92	92	290	389	351	128	67	52	46
4	31	39	50	164	94	292	411	360	122	66	51	46
5	31	39	39	188	96	294	503	362	123	63	51	47
6	31	37	41	172	92	297	546	353	112	62	51	48
7	31	36	41	116	97	316	476	331	108	70	50	47
8	31	39	28	97	133	335	459	321	112	69	48	47
9	31	44	31	105	221	348	460	312	112	68	48	47
0	31	50	40	110	135	355	492	306	109	68	46	47
1	31	41	33	111	276	356	470	298	105	68	45	47
2	31	35	34	157	227	359	438	300	99	68	45	47
3	30	40	47	194	191	391	413	291	101	68	45	47
4	30	44	42	203	189	393	381	276	122	67	45	47
5	30	48	50	232	162	371	362	273	111	66	45	47
6	30	46	59	267	146	351	361	255	101	63	45	47
7	31	80	71	265	133	342	354	234	94	62	45	47
8	30	67	74	232	124	313	340	324	90	62	46	46
9	30	43	75	213	.....	278	317	216	86	62	46	46
0	30	46	84	178	.....	254	313	216	85	64	46	47
1	31	.....	262	181	.....	240	.....	217	.....	64	46	.....

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Monthly discharge of Butt Creek at Butte Valley, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	31	29	30.2	1,800
November	80	32	43.7	2,600
December	262	28	54.5	3,350
January	697	90	212	13,000
February	276	90	142	7,800
March	393	150	278	17,100
April	546	178	387	23,000
May	403	216	321	19,700
June	219	85	134	7,970
July	84	62	68.6	4,220
August	54	45	49.3	3,030
September	48	46	46.8	2,780
The year	697	28	147	106,000

NOTE.—Monthly and yearly discharge computed by engineers of the U. S. Geological Survey.

INDIAN CREEK NEAR CRESCENT MILLS, CAL.

LOCATION.—In the SW. ¼ sec. 25, T. 26 N., R. 9 E., at the lower end of Indian Valley, about 2,000 feet below Arlington Bridge, and 1¼ miles below Crescent Mills. Spanish Creek enters 4 miles below the station.

DRAINAGE AREA.—740 square miles.

RECORDS AVAILABLE.—January 1, 1906, to December 31, 1909, and September 10, 1911, to September 30, 1914.

GAGE.—Vertical staff in three sections on right bank near observer's house. Observer, Eugene Cook.

DISCHARGE MEASUREMENTS.—Made from cable 30 feet below gage or by wading.

CHANNEL AND CONTROL.—Fairly permanent. At low stages water is deep and sluggish at gage.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 10.8 feet at 7 a. m January 1 (approximate discharge, computed from extension of rating curve, 6,900 second-feet); minimum stage recorded, 1.02 feet August 3 to 8 (discharge, 25 second-feet).

1906–1914: Maximum stage recorded, 20.2 feet at 6.30 a. m. March 19, 1907 (approximate discharge, computed from extension of rating curve, 11,700 second-feet); minimum stage recorded, 0.75 foot August 9 to 15, 1908 (discharge, 12 second-feet).

DIVERSIONS.—Water diverted from Indian Creek for irrigation in Indian and Genesee valleys.

ACCURACY.—Rating curve well defined; results excellent. Recent discharge measurements indicate that high-water estimates previously published were too low.

Discharge measurements of Indian Creek near Crescent Mills, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 1	Lasley Lee	1.17	33	Apr. 25	Charles Leidl	6.93	2,300
Feb. 2	H. J. Tompkins	4.52	904	Aug. 2	H. J. Tompkins	1.05	31
Mar. 13	Charles Leidl	7.42	3,170	30	....do	1.10	31

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discharge, in second-feet, of Indian Creek near Crescent Mills, Cal., for the year ending Sept. 30, 1914.

ıy.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	38	56	126	6,120	1,060	1,270	1,720	1,880	930	216	27	36
.....	38	66	120	6,230	865	1,560	1,640	2,040	930	200	27	36
.....	38	72	114	5,680	750	1,640	2,130	2,300	865	200	25	36
.....	38	74	108	3,050	695	1,560	2,860	2,670	865	193	25	36
.....	38	74	102	2,040	695	1,560	4,140	2,860	805	186	25	36
.....	38	72	96	1,560	865	1,800	4,250	2,760	750	179	25	36
.....	40	72	102	1,800	695	2,130	4,140	2,670	805	172	25	36
.....	40	72	102	1,340	695	2,480	4,140	2,670	805	166	25	38
.....	40	72	103	1,130	695	2,670	4,140	2,760	750	159	27	38
.....	40	72	102	750	600	2,960	5,350	2,480	695	146	29	40
.....	40	84	108	750	750	3,050	5,020	2,300	600	126	33	40
.....	42	96	110	645	645	3,140	4,800	2,130	520	120	31	40
.....	42	120	125	805	645	3,340	4,580	2,130	484	114	36	40
.....	45	118	125	1,270	645	3,440	4,360	2,130	450	108	31	40
.....	45	114	125	1,800	695	3,540	4,690	2,130	418	106	29	42
.....	48	108	114	1,200	695	3,640	5,790	2,130	418	102	29	42
.....	48	102	113	1,270	695	3,840	4,470	1,960	388	98	27	45
.....	50	108	108	1,200	865	4,040	4,040	1,880	388	96	27	45
.....	50	114	96	805	2,130	4,140	4,140	1,800	360	94	27	45
.....	48	120	106	865	3,140	4,140	4,470	1,720	360	90	27	48
.....	45	120	114	805	5,680	4,140	4,250	1,640	360	86	29	48
.....	45	114	152	1,560	3,740	4,040	4,040	1,640	334	84	31	48
.....	45	108	179	2,130	2,670	4,250	3,540	1,640	310	84	31	48
.....	45	102	146	2,400	1,960	4,470	3,050	1,560	310	82	31	48
.....	45	108	179	3,440	1,800	4,040	2,760	1,560	310	74	31	48
.....	48	133	200	5,130	1,490	3,640	2,580	1,340	288	72	31	48
.....	48	172	216	2,220	1,340	3,140	2,480	1,200	278	66	31	50
.....	50	159	208	1,880	1,200	2,760	2,300	1,060	268	61	31	50
.....	50	152	200	1,640	.....	2,480	2,040	995	250	50	31	50
.....	52	146	250	1,420	.....	2,130	1,880	995	232	40	36	50
.....	52	.....	2,300	1,200	.....	1,960	.....	930	.....	36	36	.....

—Discharge determined from a rating curve well defined below 4,000 second-feet.

ly discharge of Indian Creek near Crescent Mills, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
.....	52	38	44.2	270	B.
ber.....	172	56	103	6,130	A.
er.....	2,300	96	205	12,600	A.
.....	6,230	645	2,070	127,000	B.
y.....	5,680	600	1,370	76,100	A.
.....	4,470	1,270	3,000	184,000	A.
.....	5,790	1,640	3,660	218,000	A.
.....	2,860	930	1,930	119,000	A.
.....	930	232	518	30,800	A.
.....	216	36	116	7,130	A.
.....	36	25	29.2	1,800	B.
ber.....	50	36	42.8	2,550	B.
ıe year.....	6,230	25	1,090	788,000	

SPANISH CREEK AT KEDDIE, CAL.

ION.—In the SW. ¼ sec. 22, T. 25 N., R. 9 E., at highway bridge at Keddie, 2 iles above junction with Indian Creek.

AGE AREA.—Not measured.

DS AVAILABLE.—October 22, 1911, to September 30, 1914.

—High-water section painted on left abutment of bridge. A low-water vertical ction is fastened to a stump on left bank 20 feet below bridge. August 12, 1914, rtical staff in three sections was installed: First section on right bank 50 feet ove bridge; second section on left bank 20 feet below bridge; third section fastened to downstream side of left pier of bridge. Observer, C. O. Phillips.

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DISCHARGE MEASUREMENTS.—Made from downstream side of bridge or by wading.
CHANNEL AND CONTROL.—Gravel; shifts during high water.
EXTREMES OF DISCHARGE.—1911–1914: Maximum stage recorded during year, 10.0 feet at 11 a. m. December 31, 1913, and at 1 p. m. January 2, 1914 (approximate discharge, computed from extension of rating curve, 9,450 second-feet); minimum stage recorded, 1.1 feet July 24 to 30, 1914 (discharge, 22 second-feet).
DIVERSIONS.—Water is diverted from Spanish Creek for irrigation in American Valley.
ACCURACY.—Rating curves well defined below 2,000 second-feet; results good except for high stages.

Discharge measurements of Spanish Creek at Keddie, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 3	Lasley Lee	1.42	28	Apr. 25	Charles Leidl	3.72	638
Feb. 1	H. J. Tompkins	3.36	458	Aug. 4	H. J. Tompkins	1.45	41
Mar. 14	Charles Leidl	4.35	1,120	30	.....do	1.40	42
24	Lasley Lee	4.47	1,240				

NOTE.—To reduce gage readings of previously published discharge measurements to new datum, readings below 4.30 feet should be corrected by +0.10 foot.

Daily discharge, in second-feet, of Spanish Creek at Keddie, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	32	40	93	4,490	475	750	395	570	498	60	33	40
2	32	40	74	9,450	325	820	395	625	498	60	33	44
3	32	45	62	4,040	360	718	520	750	395	60	33	44
4	32	45	50	1,270	360	685	900	820	360	49	44	44
5	32	45	56	820	360	718	1,270	860	360	49	44	44
6	32	47	62	570	282	785	820	820	325	49	44	42
7	33	47	56	820	245	860	820	820	325	49	44	40
8	33	45	80	820	258	860	820	860	325	40	44	40
9	33	45	68	520	270	900	985	860	295	40	44	40
10	33	45	80	127	270	900	2,510	750	221	40	44	40
11	33	56	80	112	282	900	1,700	750	221	40	44	40
12	35	68	80	360	325	900	1,080	685	181	40	44	40
13	35	70	108	435	342	985	900	685	181	40	44	42
14	35	66	93	1,810	360	985	900	685	172	40	44	42
15	35	61	86	1,420	360	900	1,810	655	172	40	44	42
16	35	58	93	860	360	942	1,170	655	172	33	44	43
17	35	56	80	1,810	545	1,080	942	655	162	33	44	44
18	40	58	74	985	900	1,080	942	570	127	33	44	44
19	40	78	68	785	4,490	1,080	1,540	685	127	33	49	44
20	40	88	80	520	4,790	1,030	1,810	570	98	27	49	44
21	35	80	80	435	8,070	1,080	1,760	545	98	27	49	44
22	35	68	348	2,760	3,020	1,030	900	545	112	27	49	44
23	35	75	124	1,920	1,760	1,030	820	570	127	27	44	44
24	35	75	116	3,590	900	985	820	545	127	22	44	44
25	35	80	365	4,640	820	900	685	598	112	22	44	42
26	35	108	317	4,490	719	820	570	520	112	22	44	42
27	35	272	197	1,810	570	570	750	520	84	22	44	43
28	36	124	157	985	545	570	570	475	84	22	44	43
29	36	108	140	820	.....	598	520	395	72	22	44	43
30	38	108	302	570	.....	395	520	498	60	22	40	44
31	38	.....	9,450	520	.....	395	.....	570	.....	28	40	.....

NOTE.—Discharge determined from two fairly well defined rating curves applicable Oct. 1 to Dec. 31 and Jan. 1 to Sept. 30. No record Oct. 1–11, 17–23, and 28 to Nov. 4; discharge estimated by comparison with records of Indian Creek near Crescent Mills. No record, discharge interpolated, July 31 and Sept. 30.

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Monthly discharge of Spanish Creek at Keddie, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	40	32	34.8	2,140	C.
November	272	40	73.4	4,370	B.
December	9,450	50	423	26,000	C.
January	9,450	112	1,760	108,000	C.
February	8,070	245	1,160	64,400	B.
March	1,080	395	847	52,100	B.
April	2,510	395	1,000	59,500	B.
May	860	395	649	39,900	B.
June	498	60	207	12,300	C.
July	60	22	36.1	2,220	D.
August	49	33	43.3	2,660	B.
September	44	40	42.5	2,530	B.
The year	9,450	22	520	376,000	

MIDDLE FORK OF FEATHER RIVER NEAR CROMBERG, CAL.

LOCATION.—In the N. ½ sec. 24, T. 23 N., R. 11 E., at California White Pine Co.'s log chute, in Plumas National Forest, 600 feet southwest of post office at Cromberg. Jamison Creek enters 4 miles above and Jackson Creek half a mile below the station. December 5, 1913, station was moved downstream about 1½ miles to a point three-fourths mile above mouth of Poplar Creek and half a mile above Sloat station on Western Pacific Railway.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—November 3, 1910, to September 30, 1914 (not complete).

GAGE.—Vertical staff on downstream end of pier of log chute, near left bank; at new station a Gurley electric water-stage recorder, with an auxiliary staff in two sections on right bank. Observers, J. E. Nail and G. C. Langhorst.

DISCHARGE MEASUREMENTS.—Made from cable 200 feet above gage or by wading. Cable was moved downstream about half a mile in December, 1913.

CHANNEL AND CONTROL.—Gravel and small boulders; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage during year, from automatic gage record, 9.36 feet at 10 a. m. January 2 (approximate discharge, 10,500 second-feet); minimum stage recorded, 2.25 feet during all of October (discharge, 48 second-feet).

1910–1914: Maximum stage recorded, 13.0 feet April 7, 1911 (discharge, 9,640 second-feet); minimum stage recorded, 2.2 feet September 17 to 29, 1913 (discharge, 44 second-feet).

ACCURACY.—Rating curve for original station fairly well defined for low and medium stages; results, except for high stages, good for periods covered by gage heights; for new station rating curve is fairly well defined and results good for periods covered by the gage-height record.

COOPERATION.—Station maintained in cooperation with United States Forest Service.

Discharge measurements of Middle Fork of Feather River near Cromberg, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
ec. 6	H. J. Tompkins	2.80	73	Mar. 12	Charles Leidl	6.78	4,110
an. 22	do	5.20	1,700	Apr. 23	do	6.18	2,880
24	do	6.07	3,020	28	H. J. Tompkins	5.24	1,620
29	do	5.81	2,570	Aug. 5	do	2.86	95
ar. 11	Charles Leidl	6.66	3,720	29	do	2.78	72

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Daily discharge, in second-feet, of Middle Fork of Feather River near Cromberg, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	Aug.	Sept.
1	a 48	48	81	7,570	.....	.....	.....	1,610	1,270	a 98	63
2	a 48	a 80	87	8,640	.....	.....	.....	1,700	1,220	a 98	63
3	a 48	a 50	89	3,680	.....	.....	.....	1,860	1,170	a 98	63
4	a 48	a 51	81	4,340	.....	4,140	.....	2,040	1,020	a 94	63
5	48	a 52	83	4,040	.....	.....	.....	1,960	930	87	63
6	48	52	81	3,950	.....	.....	.....	.....	725	a 90	63
7	48	a 52	75	2,620	.....	.....	.....	.....	725	a 90	63
8	a 48	a 53	74	1,990	.....	.....	.....	.....	690	a 90	63
9	a 48	53	77	1,640	1,270	.....	.....	.....	655	a 85	63
10	a 48	53	81	1,540	.....	.....	.....	.....	655	a 80	63
11	a 48	69	81	1,250	.....	3,860	.....	.....	655	a 80	60
12	48	83	89	690	.....	4,140	.....	.....	620	a 80	60
13	a 48	98	93	a 815	.....	4,340	.....	.....	620	75	60
14	48	83	87	a 1,320	1,020	4,340	.....	.....	620	72	60
15	48	70	87	a 1,310	.....	4,140	.....	.....	655	70	63
16	48	64	87	a 1,430	.....	4,040	.....	1,840	725	69	63
17	48	72	87	a 1,520	930	.....	.....	1,910	760	68	64
18	48	77	87	a 1,550	.....	.....	.....	1,910	760	66	63
19	48	93	79	800	.....	4,750	.....	1,780	725	66	63
20	a 48	91	95	a 400	.....	.....	.....	1,720	800	69	63
21	48	91	154	448	.....	.....	.....	1,540	840	69	63
22	a 48	a 83	105	1,510	.....	.....	.....	1,540	760	68	63
23	a 48	75	128	1,640	.....	3,860	2,930	1,480	620	68	63
24	a 48	74	169	2,250	.....	.....	2,470	1,430	620	66	63
25	48	85	130	5,280	.....	.....	2,320	1,540	585	64	63
26	a 48	81	105	4,960	.....	.....	2,040	1,270	550	64	63
27	48	166	98	3,340	.....	.....	1,870	1,270	550	64	63
28	48	108	95	2,470	4,140	.....	1,720	1,320	a 520	64	63
29	48	95	120	2,400	.....	.....	1,540	1,270	490	64	63
30	a 48	91	2,770	2,250	.....	.....	1,540	1,320	460	63	63
31	a 48	.....	7,570	a 2,200	.....	.....	.....	1,320	.....	63	.....

a Estimated by comparison with discharge of Middle Fork of Feather River near Oroville, minus that of South Fork of Feather River at Enterprise.

NOTE.—Discharge May 6-15 estimated at 2,030 second-feet.

Monthly discharge of Middle Fork of Feather River near Cromberg, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	48	48	48.0	2,950	C.
November	166	48	76.4	4,550	C.
December	7,570	74	423	26,000	B.
January	8,640	.....	2,580	159,000	C.
February	.....	930	a 2,750	153,000	
March	4,750	.....	a 3,740	230,000	
April	.....	.....	a 2,670	159,000	
May	2,040	1,270	1,740	107,000	B.
June	1,270	460	733	43,600	B.
July	.....	.....	a 199	12,200	
August	.....	63	75.5	4,640	B.
September	64	60	62.2	3,700	B.
The year	8,640	48	1,250	906,000	

a Estimated by comparison with discharge of Middle Fork of Feather River near Oroville, minus that of South Fork of Feather River at Enterprise.

MIDDLE FORK OF FEATHER RIVER NEAR OROVILLE, CAL.

LOCATION.—In the NW. ¼ sec. 32, T. 26 N., R. 5 E., at highway bridge at Bidwell Bar, 2 miles above junction with the North Fork, and 7 miles northeast of Oroville. South Fork enters 1¼ miles above and Canyon Creek three-fourths mile below station.

DRAINAGE AREA.—Not measured.

RECORD AVAILABLE.—October 7, 1911, to September 30, 1914.

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AGE.—Vertical staff in three sections on left bank. Lower sections are fastened to a sycamore tree 100 feet above bridge; high-water section to lower end of bridge pier. Observer, T. W. Curry.

ISCHARGE MEASUREMENTS.—Made from cable installed April 1, 1914, 250 feet below bridge.

HANNEL AND CONTROL.—Boulders and gravel; fairly permanent.

XTREMES OF DISCHARGE.—Maximum stage recorded during year, 18.0 feet at 4 p. m. December 31 (approximate discharge, computed from extension of rating curve, 34,200 second-feet); minimum stage recorded, 2.2 feet October 5, 29, and 30 (discharge, 180 second-feet).

1911–1914: Maximum stage recorded, 18.0 feet at 4 p. m. December 31, 1913 (approximate discharge, computed from extension of rating curve, 34,200 second-feet); minimum stage recorded, 2.18 feet September 24–25, 1913 (discharge, 177 second-feet).

DIVERSIONS.—The Palermo Land & Water Co.'s canal and South Feather Land & Water Co.'s canal divert from South Fork of Feather River and tributaries.

CCURACY.—Rating curves well defined; results good, except for high stages.

Discharge measurements of Middle Fork of Feather River near Oroville, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
pr. 2	Lasley Lee	6.73	3,780	June 25	Charles Leidl	5.11	1,850
21	Charles Leidl	9.67	9,030	Sept. 10	....do	2.28	275

Daily discharge, in second-feet, of Middle Fork of Feather River near Oroville, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	196	204	525	20,400	5,820	6,000	4,030	5,130	4,030	1,150	390	280
2	184	570	480	21,600	5,130	6,540	3,880	5,640	3,880	1,150	390	280
3	184	330	440	14,000	4,650	6,360	3,880	6,360	3,590	1,080	390	280
4	184	270	400	10,400	4,330	6,180	4,180	7,110	3,180	1,020	375	280
5	180	300	365	8,280	3,880	6,180	8,280	7,490	2,800	960	360	275
6	180	480	365	6,360	3,590	6,540	7,490	7,110	2,450	900	360	275
7	184	400	365	5,470	3,450	7,110	7,680	6,920	2,920	900	360	275
8	190	315	365	6,000	3,310	7,680	7,680	7,300	2,680	840	345	280
9	184	270	365	4,810	3,050	7,880	7,490	7,300	2,340	785	330	280
10	196	270	330	4,030	2,920	8,080	13,200	6,540	2,140	785	330	275
11	196	258	365	3,310	2,800	8,080	10,600	6,000	2,040	730	330	268
12	190	525	460	2,920	2,800	8,080	9,320	6,000	2,040	730	330	268
13	190	440	570	3,880	2,800	8,480	8,480	6,360	2,040	680	310	260
14	196	525	620	8,480	2,800	8,480	8,680	6,360	1,940	680	330	260
15	196	429	525	7,300	2,800	8,280	9,760	6,540	1,940	630	318	260
16	196	365	460	5,300	2,800	8,280	11,500	6,180	1,940	630	310	275
17	196	330	440	6,360	2,800	8,680	9,540	5,640	2,040	585	305	280
18	196	348	440	6,540	3,880	9,100	8,890	5,470	1,940	585	305	285
19	190	570	400	4,970	8,890	9,320	9,100	5,300	1,940	562	305	285
20	184	525	400	3,880	8,890	9,320	9,760	5,130	2,040	540	305	280
21	184	570	400	3,880	18,200	8,890	9,100	4,970	1,760	540	305	275
22	184	440	2,720	11,500	12,000	8,680	8,280	5,300	1,600	520	305	268
23	184	382	1,280	10,200	10,900	8,890	7,490	5,130	1,520	500	300	268
24	184	365	825	12,200	9,320	8,480	6,730	4,970	1,680	500	300	260
25	184	365	3,640	16,700	8,280	7,880	6,180	6,000	1,860	460	292	260
26	184	440	1,950	17,200	7,300	7,300	5,820	4,650	1,520	460	285	255
27	184	1,760	1,140	12,500	6,730	6,540	5,640	4,330	1,360	442	285	255
28	184	1,000	880	9,760	6,180	5,640	5,300	4,180	1,290	425	285	255
29	180	770	770	8,280	.....	5,300	4,810	4,030	1,220	425	285	255
30	180	670	1,210	7,300	.....	4,810	4,810	4,030	1,220	425	280	255
31	184	.....	27,800	6,360	.....	4,490	.....	4,030	.....	408	280	.....

NOTE.—Discharge determined as follows: Oct. 1 to Dec. 31, 1913, from rating curves well defined below ,000 second-feet; Jan. 1 to Sept. 30, 1914, from curves well defined below 12,000 second-feet.

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Monthly discharge of Middle Fork of Feather River near Oroville, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	196	180	187	11,500	B.
November	1,760	204	483	28,700	A.
December	27,800	330	1,650	101,000	C.
January	21,600	2,920	8,720	536,000	C.
February	18,200	2,800	5,720	318,000	B.
March	9,320	4,490	7,470	459,000	B.
April	13,200	3,880	7,590	452,000	B.
May	7,490	4,030	5,730	352,000	A.
June	4,030	1,220	2,160	129,000	A.
July	1,150	408	678	41,700	A.
August	390	280	322	19,800	B.
September	285	255	270	16,100	B.
The year	27,800	180	3,400	2,460,000	

SOUTH FORK OF FEATHER RIVER AT ENTERPRISE, CAL.

LOCATION.—In the NE. ¼ sec. 1, T. 19 N., R. 6 E., one-half mile above highway bridge at Enterprise, about 700 feet above mouth of Powell Creek.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 8, 1911, to September 30, 1914.

GAGE.—Vertical staff in two sections on left bank, one-half mile above bridge, read October 1 to November 8, 1913; an inclined staff, at same datum, on right bank 150 feet above original gage read during remainder of year. Observer, Gus Alm.

DISCHARGE MEASUREMENTS.—Made from cable, 90 feet below inclined gage, or by wading.

CHANNEL AND CONTROL.—Gravel and small boulders; shifts during high water.

EXTREMES OF DISCHARGE.—1911–1914: Maximum stage recorded, 12.0 feet December 31, 1913 (approximate discharge, computed from extension of rating curve, 10,400 second-feet); minimum stage recorded, 0.58 foot September 29–30, October 1 to 3 and 7 to 10, 1913 (discharge, 0.9 second-foot).

DIVERSIONS.—The diversion dam of the Palermo Land & Water Co.'s canal is 1 mile above the station. The South Feather Land & Water Co.'s canal diverts from Lost and Pinkard creeks, above the station, for irrigation in the vicinity of Wyandotte and Bangor.

ACCURACY.—Rating curves fairly well defined; results fair.

Discharge measurements of South Fork of Feather River at Enterprise, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Nov. 9	Lasley Lee	3.55	32	Apr. 22	Charles Leidl	5.25	1,150
Jan. 13	R. C. Rice	5.09	972	June 24	do	3.71	217
14	do	7.20	2,940	Sept. 9	do	2.35	1.7
Mar. 22	Lasley Lee	5.13	1,030				

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ischarge, in second-feet, of South Fork of Feather River at Enterprise, Cal., for the year ending Sept. 30, 1914.

r.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	0.9	1.5	64	4,960	1,140	980	552	700	470	76	4	2
.....	.9	124	64	5,110	980	980	525	765	470	76	4	2
.....	.9	36	57	2,510	870	980	525	905	396	76	4	2
.....	1	24	50	1,920	835	835	580	980	372	76	4	2
.....	1	27	48	1,380	765	835	1,220	1,020	328	68	2.5	2
.....	1	81	44	1,060	640	835	980	980	284	68	2.5	2
.....	.9	62	44	1,220	670	905	1,020	980	470	68	2.5	2
.....	.9	51	44	1,060	670	905	980	1,060	372	60	2.5	2
.....	.9	32	50	905	580	905	1,220	1,060	306	60	2.5	2
.....	.9	26	38	835	552	905	2,110	905	306	60	2.5	2
.....	1	36	57	640	525	905	1,730	800	248	46	2.5	2
.....	1	78	50	640	525	905	1,380	765	248	46	2.5	2
.....	1	50	78	980	525	980	1,220	835	248	46	2.5	2
.....	1	57	64	3,070	525	905	1,220	835	230	40	2.5	2
.....	1	50	64	1,920	470	905	1,730	835	212	34	2.5	2
.....	1	57	53	1,300	470	905	1,600	800	212	34	2.5	2
.....	1	38	50	1,920	525	905	1,300	765	212	34	2.5	2
.....	1.5	64	50	1,920	1,060	1,060	1,220	670	212	24	2.5	2
.....	1.5	78	48	1,380	2,110	1,060	1,220	640	212	24	2.5	2
.....	1.5	78	50	1,220	3,430	1,060	1,300	640	196	24	2.5	2
.....	1.5	73	50	1,140	4,660	1,060	1,220	580	164	20	2.5	2
.....	1.5	57	842	2,950	2,310	980	1,100	580	134	20	2.5	2
.....	1.5	50	184	2,510	2,310	980	905	670	134	16	2.5	2
.....	1.5	50	175	4,510	1,730	1,020	835	640	212	16	2.5	2
.....	1	57	1,560	4,810	1,550	1,020	800	905	196	13	2.5	2
.....	.9	68	190	3,950	1,300	870	765	640	180	10	2.5	2
.....	1.5	408	190	2,730	1,140	765	835	552	120	10	2.5	2
.....	1.5	160	145	2,730	1,060	700	732	525	96	10	2.5	2
.....	1.5	104	117	1,730	.....	765	700	498	76	7.5	2.5	2
.....	1.5	82	340	1,380	.....	640	640	470	76	5	2.5	2
.....	1.5	.....	10,400	1,300	.....	640	.....	498	.....	4	2	.....

–Discharge determined as follows: Oct. 1 to Nov. 8, 1913, old gage on left bank, from fairly well ating curves; Nov. 9 to Dec. 31, 1913, new gage on right bank, from poorly defined curve prepared isurements made Nov. 9, 1913, and general relation between gages; Jan. 1 to Sept. 30, 1914, from ll defined curve.

y discharge of South Fork of Feather River at Enterprise, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
.....	1.5	0.9	1.17	72	C.
er.....	408	1.5	72.0	4,280	C.
r.....	10,400	38	492	30,300	D.
.....	5,110	640	2,120	130,000	C.
.....	4,660	470	1,210	67,200	B.
.....	1,060	640	906	55,700	B.
.....	2,110	525	1,070	63,700	B.
.....	1,060	470	758	46,600	B.
.....	212	76	246	14,600	B.
.....	76	4	37.8	2,320	C.
.....	4	2	2.68	165	C.
er.....	2	2	2.0	119	C.
e year.....	10,400	.9	574	415,000	

PALERMO LAND & WATER CO.'S CANAL AT ENTERPRISE, CAL.

ON.—In the NE. ¼ sec. 1, T. 19 N., R. 6 E., half a mile above highway bridge Enterprise and 1 mile below intake at diversion dam on South Fork of ather River.

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RECORDS AVAILABLE.—October 8, 1911, to September 30, 1914.

GAGE.—Vertical staff fastened to post on right bank; datum was lowered 1.00 foot c November 9, 1913. New staff, March 22, installed in flume 800 feet above orig nal gage. Observer, Gus Alm.

DISCHARGE MEASUREMENTS.—Made by wading.

CHANNEL AND CONTROL.—Gravel and sand.

EXTREMES OF DISCHARGE.—1911–1914: Maximum discharge, 40 second-feet, Jul 24, 1914; canal dry during parts of each year.

ACCURACY.—Rating curves fairly well defined; results good.

Canal furnishes water for irrigation below Oroville.

Discharge measurements of Palermo Land & Water Co.'s canal at Enterprise, Cal., duri the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.[a]	Gage height.[b]	Dis-charge.	Date.	Made by—	Gage height.[a]	Gage height.[b]	Dis-charge.
		Feet.	*Feet.*	*Sec.-ft.*			*Feet.*	*Feet.*	*Sec.-*
Nov. 9	Lasley Lee.....	1.26	.....	7.8	Apr. 22	Charles Leidl...	1.79	1.02	
Jan. 14	R. C. Rice.....	.80	.....	[c].2	June 24	.....do.....	2.26	1.52	
Mar. 22	Lasley Lee.....	1.77	.98	20	Sept. 9	.....do.....	2.10	1.32	

[a] Gage installed Nov. 9 1913; datum 1.00 foot lower than that of original gage.
[b] Gage installed in flume 800 feet above old gage Mar. 22 1914.
[c] Estimated

Daily discharge, in second-feet, of Palermo Land & Water Co.'s canal at Enterprise, Ca for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sep
1.....	19.5	19	10.5	0.0	0.0	22	20	21	37	37	39	
2.....	19	10.5	10.5	.0	.0	22	19.5	25	37	37	38	
3.....	18.5	13	10.5	.0	1.8	22	19.5	26	37	37	37	
4.....	19	13	12	.0	1.8	22	20	29	37	37	39	
5.....	18.5	13	12	.0	1.8	22	21	29	36	36	39	
6.....	18.5	13	12	13	20	22	21	30	36	36	37	
7.....	19	8.6	12	.1	19.5	22	21	30	34	38	37	
8.....	20	7.8	12	.0	19.5	25	20	33	30	38	36	
9.....	20	7.8	12	.2	19.5	24	21	33	33	38	35	
10.....	20	9.5	12	.0	19.5	24	23	32	33	38	35	
11.....	20	9.3	12.5	16	19.5	24	22	32	33	38	35	
12.....	20	9.3	12.5	8.6	19.5	24	21	34	33	38	35	
13.....	19	10	12.5	.0	19.5	25	21	34	33	38	34	
14.....	20	10	12.5	.2	19.5	25	21	36	33	37	34	
15.....	20	10	12.5	.0	19.5	25	22	36	33	39	33	
16.....	20	9.5	12	.0	19.5	25	22	36	33	39	32	
17.....	20	9.3	12	.0	19.5	24	22	36	36	39	30	
18.....	19.5	10	12	.0	6.9	0	22	35	36	38	30	
19.....	19.5	10.5	12	.0	6.2	0	22	37	36	39	30	
20.....	19	10.5	12	.0	7.1	0	22	37	36	39	30	
21.....	19	9.9	12	.0	8.0	20	22	37	36	39	30	
22.....	19	9.9	11	.0	6.9	21	22	37	37	39	30	
23.....	19	9.9	12	.0	6.9	21	21	37	37	39	30	
24.....	19	9.9	12.5	.0	6.2	21	21	34	35	40	29	
25.....	19	10	2.4	.0	22	21	21	33	35	39	30	
26.....	18.5	12	11	.0	22	21	20	36	34	39	29	
27.....	18.5	13	10.5	.0	22	21	20	37	37	40	29	
28.....	18.5	10.5	10.5	.0	22	20	20	37	37	39	29	
29.....	19	10.5	10.5	.0	.....	20	21	37	37	40	29	
30.....	19.5	9.9	4.8	.0	.....	19.5	20	36	37	39	29	
31.....	19.5	.....	.0	.0	.....	19.5	.....	37	.....	39	29	....

NOTE.—Discharge determined as follows: Oct. 1, 1913, to Feb. 2, 1914, for old gage, from well-defi ng curve; Feb. 3 to Mar. 31, 1914, from fairly well defined curve; Apr. 1 to Sept. 30, 1914, for gag se, from well-defined curve.

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Monthly discharge of Palermo Land & Water Co.'s canal at Enterprise, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	20	18.5	19.3	1,190	A.
November	19	7.8	10.6	631	A.
December	12.5	.0	10.5	646	A.
January	16	.0	1.23	76	D.
February	22	.0	13.4	744	B.
March	25	.0	20.1	1,240	B.
April	23	19.5	21.0	1,250	A.
May	37	21	33.5	2,060	A.
June	37	30	35.1	2,090	A.
July	40	36	38.3	2,360	A.
August	39	29	32.8	2,020	A.
September	30	25	27.9	1,660	A.
The year	40	.0	22.0	16,000	

MIDDLE FORK OF YUBA RIVER[1] NEAR NORTH SAN JUAN, CAL.

LOCATION.—In the N. ½ NW. ¼ sec. 23, T. 18 N., R. 8 E., below highway bridge at Freemans Crossing, 1¼ miles northeast of North San Juan. Oregon Creek enters three-fourths mile above, Moonshine Creek one-fourth mile below, and north Fork of Yuba River about 4 miles below the station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 27, 1910, to September 30, 1914.

GAGE.—Vertical staff wedged between two large boulders on right bank one-fourth mile below bridge. Observer, Henry Zurhorst.

DISCHARGE MEASUREMENTS.—Made from cable 200 feet above gage or by wading.

CHANNEL AND CONTROL.—Gravel and small boulders; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 11.5 feet December 31 (discharge, 13,700 second-feet); minimum stage recorded, 4.30 feet September 23 to 27 (discharge, 35 second-feet).

1910–1914: Maximum stage recorded, 11.5 feet December 31, 1913 (discharge, 13,700 second-feet); minimum stage recorded, 4.30 feet September 25 to 27, 1914 (discharge, 35 second-feet).

ACCURACY.—Rating curves fairly well defined; results fair. Estimates for high water are based on flood measurements made in 1915.

Discharge measurements of Middle Fork of Yuba River near North San Juan, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
an. 17	Charles Leidl	6.70	1,440	Feb. 6	H. J. Tompkins	5.70	703
18	do	6.99	1,900				

[1] Known locally as Middle Yuba River.

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Daily discharge, in second-feet, of Middle Fork of Yuba River near North San Juan, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	44	64	125	5,110	1,100	1,030	548	850	1,610	392	85	55
2	40	145	120	7,140	965	940	548	1,080	1,360	370	85	55
3	40	80	105	2,870	880	895	575	1,480	1,180	348	80	55
4	40	70	100	1,760	805	810	700	1,610	1,030	325	80	48
5	40	80	96	1,240	738	810	1,610	1,760	850	285	72	48
6	40	130	96	895	705	850	1,360	1,760	700	285	72	40
7	40	105	96	940	645	940	1,240	1,760	735	265	65	40
8	44	84	96	985	618	985	1,130	1,760	605	245	65	60
9	44	70	84	770	618	1,010	1,360.	1,760	575	228	65	55
10	40	64	80	635	590	1,030	3,520	1,360	520	210	60	48
11	40	100	100	548	618	985	2,090	1,300	605	210	60	40
12	44	210	100	492	618	985	1,610	1,420	635	182	60	40
13	44	150	150	1,420	590	985	1,360	1,610	635	182	60	40
14	40	125	150	2,560	590	1,030	1,240	1,610	668	182	60	40
15	40	112	138	1,610	540	985	2,270	1,760	700	175	60	40
16	44	96	120	1,080	565	1,030	2,270	1,760	770	160	55	55
17	44	90	105	1,540	618	1,130	1,680	1,480	810	151	60	55
18	44	100	112	1,760	738	1,300	1,610	1,540	770	160	60	60
19	40	150	105	1,130	1,840	1,240	1,760	1,480	810	151	60	60
20	40	156	105	810	3,310	1,240	1,610	1,480	770	145	60	60
21	37	180	112	850	4,870	1,240	1,680	1,610	635	139	60	55
22	44	130	840	3,960	2,870	1,240	1,180	1,680	575	139	60	48
23	44	105	320	3,300	2,090	1,360	1,080	1,480	520	130	60	35
24	40	100	245	4,870	1,680	1,240	895	1,480	635	121	60	35
25	40	125	1,020	7,680	1,480	1,030	850	1,760	575	115	60	35
26	40	130	605	4,870	1,240	940	850	1,130	465	109	60	35
27	50	405	320	3,100	1,130	770	810	1,130	440	109	55	35
28	50	210	245	2,350	1,030	700	735	1,030	415	100	55	40
29	44	125	210	1,770	.....	700	735	1,240	415	91	55	40
30	44	150	550	1,520	.....	635	700	1,480	415	91	48	40
31	40	.....	12,100	1,300	.....	605	.....	1,480	.....	91	55	.....

NOTE.—Discharge determined from three fairly well defined rating curves. Discharge Mar. 9 interpolated.

Monthly discharge of Middle Fork of Yuba River near North San Juan, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	50	37	42.1	2,590	C.
November	405	64	128	7,620	C.
December	12,100	80	605	37,200	C.
January	7,680	492	2,290	141,000	C.
February	4,870	540	1,220	67,800	C.
March	1,360	605	989	60,800	C.
April	3,520	548	1,320	78,600	C.
May	1,760	850	1,490	91,600	C.
June	1,610	415	714	42,500	C.
July	392	91	190	11,700	C.
August	85	48	63.0	3,870	C.
September	60	35	46.4	2,760	C.
The year	12,100	35	756	548,000	

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YUBA RIVER AT SMARTSVILLE, CAL.

LOCATION.—In sec. 22, T. 16 N., R. 6 E., at the Narrows, 1 mile north of Smartsville 18 miles above junction with Feather River, 6½ miles below mouth of South Fork, 1 mile below mouth of Deer Creek, and 7 miles above mouth of Dry Creek.

DRAINAGE AREA.—1,220 square miles.

RECORDS AVAILABLE.—June 2, 1903, to September 30, 1914.

GAGE.—Staff in three sections, bolted to solid rock on left bank; gage datum was lowered 10 feet August 1, 1906. Observer, J. R. McKeel.

DISCHARGE MEASUREMENTS.—Made from cable at gage or by wading.

CHANNEL AND CONTROL.—Gravel and small boulders; shifts during high water. As the result of extensive hydraulic mining in the early days the channel has been filled with an enormous quantity of tailings; the depth of mining débris at the station is estimated to be more than 80 feet.

EXTREMES OF DISCHARGE.—Maximum stage during year, crest of flood indicated by drift marks, 24.0 feet December 31 (discharge, computed from extension of rating curve, 61,200 second-feet); minimum stage recorded, 3.23 feet October 5 (discharge, 216 second-feet).

1903–1914: Maximum stage recorded, 28.3 feet January 15, 1909 (discharge, 111,000 second-feet); minimum stage recorded, 3.23 feet October 5, 1913 (discharge, 216 second-feet).

DIVERSIONS AND STORAGE.—Water is diverted for power and irrigation above the station. Several small glacial lakes near the headwaters of the South Fork of Yuba are utilized as storage reservoirs. A part of this water is diverted into the drainage basins of Bear and American rivers.

ACCURACY.—Conditions for obtaining accurate discharge data at high stages are poor, owing to the shifting of the channel and the torrential nature of the stream. Results, except at high stages, are good.

Discharge measurements of Yuba River at Smartsville, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 4	Lasley Lee	3.24	219	Apr. 20	Charles Leidl	11.40	13,700
Jan. 16	R. C. Rice	10.45	7,460	June 22	....do	7.76	4,320
28	....do	12.31	13,200	Sept. 7	....do	3.92	338
Feb. 27	Charles Leidl	10.12	6,740				

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Daily discharge, in second-feet, of Yuba River at Smartsville, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	220	230	500	33,200	6,160	4,760	2,700	5,930	8,920	2,800	665	352
2	220	880	500	25,800	5,450	4,320	2,890	7,150	9,440	2,670	665	339
3	218	450	450	18,700	4,540	3,890	3,480	9,180	8,150	2,300	635	339
4	218	400	450	12,100	4,100	3,280	3,890	10,800	7,150	2,180	605	339
5	216	360	450	10,900	3,080	3,680	4,540	11,400	6,650	2,070	575	339
6	218	360	450	10,600	2,700	4,100	4,320	11,400	5,250	1,860	545	339
7	218	400	450	9,680	2,520	4,540	4,990	11,400	5,470	1,760	515	330
8	222	400	450	7,160	2,340	4,760	4,540	11,900	4,630	1,670	515	330
9	226	450	555	6,400	2,160	4,990	5,220	11,600	4,070	1,490	485	352
10	230	500	670	4,760	2,160	4,540	18,700	9,440	4,070	1,400	485	339
11	230	670	740	4,320	1,990	4,320	15,500	11,600	4,440	1,400	485	330
12	230	810	1,120	3,680	1,990	4,100	12,200	9,440	5,040	1,360	485	330
13	230	1,120	960	4,100	1,990	3,890	16,400	10,500	5,040	1,320	485	308
14	230	880	555	4,990	1,820	4,760	15,200	11,600	5,040	1,240	485	308
15	230	740	500	5,450	1,660	4,990	12,200	11,600	5,700	1,160	430	308
16	230	670	450	7,160	1,500	4,990	8,150	11,100	5,930	1,080	430	310
17	230	555	425	7,160	1,500	5,450	9,180	8,920	6,170	1,010	430	352
18	230	400	450	13,700	1,210	6,400	8,920	9,970	5,930	935	430	352
19	230	450	555	14,000	1,080	5,920	8,150	9,700	5,930	935	430	330
20	230	555	610	15,300	950	5,450	14,000	9,700	5,930	900	430	330
21	230	670	740	12,700	1,080	4,990	11,100	9,700	5,470	865	430	330
22	230	810	810	11,500	1,990	4,990	7,430	10,500	4,440	830	430	339
23	226	500	810	9,680	2,700	4,760	6,670	9,440	3,890	795	430	330
24	222	400	1,470	7,160	5,450	4,100	5,980	9,440	4,070	795	430	308
25	220	450	7,930	9,980	6,900	3,890	5,640	11,100	4,070	762	430	308
26	220	450	4,310	13,000	6,900	3,480	5,410	8,150	3,720	730	430	285
27	220	450	2,680	25,800	6,400	3,280	5,540	7,400	3,230	730	375	285
28	220	400	2,180	18,700	5,680	3,080	4,920	7,650	2,940	665	375	339
29	220	450	1,470	13,400	.....	2,890	4,690	7,650	2,940	665	375	308
30	230	500	1,380	8,240	.....	2,700	4,830	9,180	2,940	665	352	285
31	230	.....	45,700	7,420	.....	2,520	.....	9,440	.....	665	352	.....

NOTE.—Discharge determined from 3 fairly well defined rating curves. Discharge Apr. 22–30 estimated by comparison with record of discharge of North and Middle forks; Aug. 4 and 5 interpolated.

Monthly discharge of Yuba River at Smartsville, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	230	216	225	13,800	B.
November	1,120	230	545	32,400	B.
December	45,700	425	2,610	160,000	C.
January	33,200	3,680	11,500	707,000	C.
February	6,900	950	3,140	174,000	C.
March	6,400	2,520	4,320	266,000	C.
April	18,700	2,700	7,910	471,000	B.
May	11,900	5,930	9,810	603,000	B.
June	9,440	2,940	5,220	311,000	C.
July	2,800	665	1,280	78,700	C.
August	665	352	472	29,000	B.
September	352	285	326	19,400	B.
The year	45,700	216	3,960	2,870,000	

NORTH FORK OF YUBA RIVER[1] AT GOODYEAR BAR, CAL.

LOCATION.—In the E. ¼ SW. ¼ sec. 5, T. 19 N., R. 10 E., at highway bridge at Goodyear Bar, in Tahoe National Forest, North Fork of North Fork of Yuba River enters at Downieville, 4 miles above, and Rock Creek and Goodyear Creek one-eighth and one-fourth mile, respectively, below the station.

DRAINAGE AREA.—214 square miles.

RECORDS AVAILABLE.—October 31, 1910, to September 30, 1914.

GAGE.—Vertical staff in two sections on left bank. Lower section is fastened to old piling under bridge; upper to left abutment of bridge. Observer, G. E. King.

DISCHARGE MEASUREMENTS.—Made from downstream side of bridge or by wading.

[1] Known locally as North Yuba River.

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EL AND CONTROL.—Solid rock, small boulders, and gravel; apparently rmanent.

MES OF DISCHARGE.—1910–1914, maximum stage recorded: 11.0 feet Decem- r 31, 1913 (discharge, 11,500 second-feet); minimum stage recorded, October 13 21, 1912, and September 16 to October 31, 1913 (discharge, 116 second-feet).

ACY.—Rating curve well defined; results good.

RATION.—Station maintained in cooperation with United States Forest Service.

following discharge measurement was made by H. J. Tompkins:
ruary 8, 1914: Gage height, 4.45 feet; discharge, 665 second-feet.

discharge, in second-feet, of North Fork of Yuba River at Goodyear Bar, Cal., for the year ending Sept. 30, 1914.

ay.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	116	180	146	5,130	945	1,030	988	1,500	3,480	1,080	310	146
.....	116	180	146	5,320	865	945	988	1,820	3,120	945	300	146
.....	116	163	146	2,290	790	905	1,030	2,290	2,760	865	290	146
.....	116	146	146	1,600	752	945	2,410	2,790	2,410	828	280	151
.....	116	163	131	1,300	715	1,030	1,930	2,660	2,050	790	270	157
.....	116	240	131	1,120	680	1,030	1,820	2,920	1,710	715	260	163
.....	116	180	131	1,120	680	1,160	1,710	3,330	1,710	645	260	163
.....	116	131	131	1,030	645	1,210	1,710	3,480	1,500	612	260	180
.....	116	131	131	865	645	1,210	3,780	2,790	1,500	580	250	180
.....	116	131	131	715	645	1,300	3,190	2,660	1,450	580	240	174
.....	116	260	146	715	645	1,300	2,410	2,790	1,400	580	240	169
.....	116	220	146	715	645	1,350	2,050	2,920	1,500	580	220	163
.....	116	220	180	865	645	1,400	2,050	2,920	1,600	580	220	163
.....	116	146	163	1,500	645	1,400	2,170	3,940	1,820	550	220	163
.....	116	146	146	1,180	645	1,400	3,940	3,780	1,930	520	220	180
.....	116	146	146	865	645	1,500	2,790	3,190	2,170	490	220	180
.....	116	146	131	1,030	715	1,710	2,290	2,920	2,050	460	220	180
.....	116	220	131	1,030	865	1,710	2,410	2,920	1,860	460	220	180
.....	116	220	146	865	1,210	1,820	2,920	3,050	1,680	432	220	180
.....	116	220	146	715	3,190	1,820	2,790	3,330	1,490	432	220	180
.....	116	180	146	715	2,290	1,820	2,410	3,780	1,300	432	200	180
.....	116	146	355	2,050	1,710	1,710	2,050	3,050	1,400	432	200	180
.....	116	146	220	1,820	1,400	1,710	1,820	2,920	1,300	432	200	180
.....	116	146	260	2,790	1,210	1,710	1,710	2,530	1,600	405	190	180
.....	116	163	460	4,430	1,120	1,600	1,600	2,530	1,300	355	180	180
.....	116	180	305	3,190	1,030	1,500	1,500	2,660	1,500	330	180	180
.....	116	355	260	2,050	945	1,300	1,600	2,790	1,600	330	163	180
.....	116	278	220	1,600	945	1,210	1,400	2,920	1,120	330	163	180
.....	116	200	220	1,300	.....	1,120	1,300	2,980	1,030	330	146	180
.....	116	163	645	1,210	.....	1,080	1,400	3,050	1,030	330	146	180
.....	116	.....	9,730	1,030	.....	1,030	.....	2,790	.....	320	146	.....

:.—Discharge determined from a well-defined rating curve.

ly discharge of North Fork of Yuba River at Goodyear Bar, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 214 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
r.....	116	116	116	0.542	0.62	7,130	C.
ber.....	355	131	185	.864	.96	11,000	B.
ber.....	9,730	131	506	2.36	2.72	31,100	B.
y.....	5,320	715	1,680	7.85	9.05	103,000	B.
ry.....	3,190	645	995	4.65	4.84	55,300	B.
.....	1,820	905	1,350	6.31	7.28	83,000	B.
.....	3,940	988	2,070	9.67	10.79	123,000	B.
.....	3,940	1,500	2,900	13.6	15.68	178,000	B.
.....	3,480	1,030	1,750	8.18	9.13	104,000	B.
.....	1,080	320	540	2.52	2.90	33,200	B.
.....	310	146	221	1.03	1.19	13,600	B.
ber.....	180	146	171	.799	.89	10,200	B.
he year.....	9,730	116	1,040	4.86	66.05	753,000	

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NORTH FORK OF NORTH FORK OF YUBA RIVER[1] AT DOWNIEVILLE, CAL.

LOCATION.—In the NE. ¼ NW. ¼ sec. 35, T. 20 N., R. 10 E., at upper highway bridge in Downieville, 500 feet above dam, and one-fourth mile above junction with North Fork of Yuba River. Middle Fork of North Fork enters 1¼ miles and East Fork of North Fork one-eighth mile above the station.

DRAINAGE AREA.—71.2 square miles.

RECORDS AVAILABLE.—November 1, 1910, to September 30, 1914.

GAGE.—Vertical staff fastened to right abutment of bridge.

DISCHARGE MEASUREMENTS.—Usually made from bridge at gage or by wading.

CHANNEL AND CONTROL.—Gravel and small boulders; apparently permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 7.5 feet at 4 p. m. December 31 (discharge, 5,840 second-feet); minimum stage recorded, 2.58 feet October 1 to 13 (discharge, 40 second-feet).

1910–1914: Maximum stage recorded, 7.5 feet at 4 p. m. December 31, 1913 (discharge, 5,840 second-feet); minimum stage recorded, 2.55 feet October 14 to 18, 1912 (discharge, 36 second-feet).

DIVERSIONS.—The intake of the municipal water system of Downieville is above the station.

ACCURACY.—Rating curve is well defined and results are good. Flashboards placed on the dam below the gage July 26, 1914, probably cause slight backwater at the gage during low water; otherwise the record is good.

COOPERATION.—Gage-height record furnished by John T. Mason.

No discharge measurements were made during the year.

Daily discharge, in second-feet, of North Fork of North Fork of Yuba River at Downieville, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	40	61	57	2,150	328	328	300	480	950	250	74	50
2	40	57	57	2,580	275	355	300	655	815	214	61	50
3	40	42	57	860	250	355	300	770	730	205	90	50
4	40	54	50	515	241	311	300	1,260	690	205	90	50
5	40	57	50	385	228	300	770	1,000	515	205	90	50
6	40	103	50	355	205	355	655	1,000	480	173	78	50
7	40	68	50	355	205	355	620	1,000	415	165	78	50
8	40	45	50	328	185	415	550	1,150	415	165	78	50
9	40	42	50	275	197	415	1,870	1,000	415	165	78	50
10	40	42	50	228	205	448	1,620	860	415	165	78	50
11	40	98	57	205	205	480	950	860	355	137	68	50
12	40	103	50	205	205	480	770	950	355	130	68	50
13	40	90	61	250	205	480	690	1,000	355	108	78	50
14	42	61	57	448	205	448	770	1,200	385	103	78	50
15	42	45	57	328	205	480	1,680	1,100	448	103	68	50
16	42	50	57	260	205	515	1,100	905	550	98	68	50
17	42	42	61	300	205	655	860	1,000	515	90	68	50
18	42	68	57	300	250	690	860	950	515	78	68	50
19	42	57	57	228	355	690	1,200	950	480	78	68	50
20	42	74	57	205	815	690	1,200	950	415	78	68	50
21	42	68	57	205	860	690	950	950	355	78	68	50
22	42	54	116	770	585	690	730	905	355	78	68	50
23	41	50	78	655	448	690	620	905	300	78	68	50
24	41	50	78	1,050	355	620	550	860	385	68	57	50
25	41	61	165	2,890	344	550	550	905	355	83	50	50
26	41	57	130	1,380	300	480	480	770	300	78	50	50
27	41	148	103	730	300	415	480	950	300	78	50	50
28	41	83	78	620	275	415	300	730	250	78	50	50
29	41	78	78	448	.....	415	355	860	250	78	50	50
30	41	61	228	355	.....	355	385	905	250	90	50	50
31	41	.....	4,940	355	.....	328	.....	950	.....	90	50	.....

NOTE.—Discharge determined from a well-defined rating curve.

[1] Known locally as North Fork of North Yuba River.

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Monthly discharge of North Fork of North Fork of Yuba River at Downieville, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 71.2 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	42	40	40.9	0.574	0.66	2,510	B.
November	148	42	65.6	.921	1.03	3,900	B.
December	4,940	50	230	3.23	3.72	14,100	B.
January	2,890	205	652	9.16	10.56	40,100	B.
February	860	185	309	4.34	4.52	17,200	B.
March	690	300	480	6.74	7.77	29,500	B.
April	1,870	300	759	10.7	11.94	45,200	B.
May	1,260	480	927	13.0	14.99	57,000	B.
June	950	250	444	6.24	6.96	26,400	B.
July	250	68	122	1.71	1.97	7,500	C.
August	90	50	67.9	.954	1.10	4,180	C.
September	50	50	50.0	.702	.78	2,980	C.
The year	4,940	40	346	4.86	66.00	251,000	

NOTE.—The quantity of water diverted for the water supply of Downieville is so small that it is negligible in computing discharge per square mile and run-off (depth in inches).

ROCK CREEK AT GOODYEAR BAR, CAL.

LOCATION.—In the W. ½ SW. ¼ sec. 5, T. 19 N., R. 10 E., at footbridge at Goodyear Bar, in Tahoe National Forest. Woodruff Creek enters 350 feet above the station. Rock Creek joins the North Fork of Yuba River 600 feet below the station.

DRAINAGE AREA.—10.8 square miles.

RECORDS AVAILABLE.—October 30, 1910, to September 30, 1914.

GAGE.—Vertical staff fastened to alder tree on right bank 40 feet below bridge. Observer, G. E. King.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Boulders and gravel; somewhat shifting at high stages.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 7.0 feet December 31 (roughly approximated discharge, 820 second-feet); minimum stage recorded, 2.05 feet October 2 to 5 (discharge, 0.8 second-foot.)

1910–1914: Maximum stage recorded, 7.0 feet December 31, 1913 (roughly approximated discharge, 820 second-feet); minimum stage recorded, 2.0 feet during parts of August and September, 1911 and 1913 (discharge, 0.5 second-foot).

DIVERSIONS.—Three small ditches (total capacity about 10 second-feet) head above the station.

ACCURACY.—Rating curves fairly well defined; results fair.

COOPERATION.—Station maintained in cooperation with United States Forest Service.

The following discharge measurement was made by H. J. Tompkins:

February 9, 1914: Gage height, 2.00 feet; discharge, 38 second-feet.

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Daily discharge, in second-feet, of Rock Creek at Goodyear Bar, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Sept.
1	1.0	7	3.5	385	73	83	42	54	17	4	.....
2	.8	2.1	3.5	477	63	83	42	54	16	4	.....
3	.8	2.1	3	215	58	73	42	54	15	4	.....
4	.8	2.1	2.5	133	50	63	94	68	14	4	.....
5	.8	2.5	2.5	106	46	63	83	63	13	4	.....
6	1.0	1.7	2.5	83	42	68	73	63	22	2.5	.....
7	1.0	1.4	2.5	94	39	73	73	63	33	1.5	.....
8	1.0	1.4	2.5	83	39	73	73	63	20	1.5	.....
9	1.0	1.4	2.5	68	39	73	235	58	17	1.5	.....
10	1.0	1.4	2.5	58	39	73	147	54	15	1.5	.....
11	1.0	14	2.5	54	39	73	119	54	13	.....	.....
12	1.0	5	2.5	50	36	73	94	54	13	.....	.....
13	1.0	5	5	83	36	73	94	54	11	.....	.....
14	1.0	3.5	4.2	180	36	73	100	46	9	.....	.....
15	1.0	2.5	3.5	132	33	73	133	46	9	.....	.....
16	1.0	2.5	3.5	83	33	73	106	46	9	.....	.....
17	1.0	2.5	3	106	39	78	94	42	7.5	.....	.....
18	1.0	5	3	106	73	83	94	39	7.1	.....	.....
19	1.0	6	3.5	83	119	83	94	36	6.7	.....	.....
20	1.0	7	3.5	63	477	83	88	33	6.3	.....	1.1
21	1.0	5	3.5	63	275	83	83	27	6	.....	1.1
22	1.0	3.5	52	340	180	78	73	27	6	.....	1.1
23	1.0	3	14	235	133	78	63	30	6	.....	1.1
24	1.4	2.5	43	501	106	73	58	33	11	.....	1.1
25	1.4	3.5	83	698	94	73	54	39	9	.....	1.1
26	1.4	5	34	318	83	63	50	35	9	.....	1.1
27	1.4	26	26	197	83	58	54	31	7.5	.....	1.1
28	1.4	16	14	147	83	54	50	27	4	.....	.....
29	1.7	5	14	106	.....	50	50	24	4	.....	.....
30	1.7	3.5	137	94	.....	46	54	22	4	.....	.....
31	1.7	.....	650	83	.....	46	.....	22	.....	.....	.....

NOTE.—Discharge determined from 2 fairly well defined rating curves, one applicable Oct. 1 to Dec. 31, the other Jan. 1 to Sept. 30. Discharge interpolated Oct. 14–16; Nov. 3; Jan. 15; Apr. 24; May 26, 27, and 29; June 2–4, 10, 18–20, and July 4. Mean discharge July 11 to Sept. 30 estimated at 1.0 second-foot.

Monthly discharge of Rock Creek at Goodyear Bar, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	1.7	0.8	1.11	68	D.
November	26	1.4	4.97	296	D.
December	650	2.5	36.5	2,240	C.
January	698	50	175	10,800	C.
February	477	33	87.4	4,850	C.
March	83	46	70.7	4,350	C.
April	235	42	83.6	4,970	C.
May	68	22	43.9	2,700	C.
June	33	4	11.3	672	D.
July	4	.....	a 1.6	98	D.
August	.....	.....	a 1.0	61	D.
September	.....	.....	a 1.0	60	D.
The year	698	.....	43.0	31,200	

a Estimated.

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GOODYEAR CREEK AT GOODYEAR BAR, CAL.

LOCATION.—In the W. ½ SW. ¼ sec. 5, T. 19 N., R. 10 E., at trail bridge, in Tahoe National Forest, 300 feet above junction with North Fork of Yuba River, and half a mile north of Goodyear Bar.

DRAINAGE AREA.—12.2 square miles.

RECORDS AVAILABLE.—October 30, 1910, to September 30, 1914.

GAGE.—Vertical staff fastened to an alder tree on left bank, 200 feet above bridge. Observer, G. E. King.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Solid rock and gravel; fairly permanent.

EXTREMES OF DISCHARGE.—1910–1914: Maximum stage recorded, 7.0 feet at 3 p. m. December 31, 1913 (approximate discharge, computed from extension of rating curve, 1,460 second-feet); minimum stage recorded, 1.25 feet from August 14 to September 30, 1914 (discharge, 2 second-feet).

DIVERSIONS.—Three small irrigation ditches, having a total capacity of about 7½ second-feet, head above the station.

ACCURACY.—Rating curves well defined for low and medium stages; results good except for high water.

COOPERATION.—Station maintained in cooperation with United States Forest Service.

The following discharge measurement was made by H. J. Tompkins:
February 9, 1914: Gage height, 2.25 feet; discharge, 59 second-feet.

Daily discharge, in second-feet, of Goodyear Creek at Goodyear Bar, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	3.5	18	9.8	505	99	125	65	106	21	7	a 3	2
.....	3.5	6	9.8	565	87	112	65	112	a 21	7	a 2.9	2
.....	3.5	a 6	7.5	313	87	106	65	112	a 21	7	a 2.8	2
.....	3.5	6	7.5	153	76	106	168	125	a 21	a 7	a 2.7	a 2
.....	3.5	9.8	7.5	125	70	112	139	125	21	7	a 2.6	a 2
.....	3.5	7.5	7.5	112	65	112	125	125	21	7	2.5	2
.....	3.5	6	7.5	125	65	125	125	132	36	7	2.5	2
.....	3.5	6	7.5	112	60	139	132	118	28	7	2.5	2
.....	3.5	6	7.5	99	60	139	338	99	21	7	a 2.5	2
.....	3.5	6	7.5	87	60	146	250	87	a 21	5.5	2.5	a 2
.....	4.5	29	7.5	76	60	146	183	87	21	4	2.5	a 2
.....	4.5	12	7.5	76	60	146	153	87	21	4	2.5	2
.....	4.5	15	15	112	60	146	153	82	21	4	2.5	2
.....	a 4.5	9.8	12	183	60	146	168	82	18	a 4	2	2
.....	a 4.5	7.5	9.8	a 148	60	139	199	76	18	a 4	2	2
.....	a 4.5	7.5	9.8	112	60	146	168	65	18	a 4	2	2
.....	4.5	7.5	7.5	125	70	168	146	65	15	4	2	2
.....	4.5	18	7.5	125	112	168	153	60	a 14	4	2	2
.....	4.5	15	7.5	99	153	176	153	54	a 12	4	2	a 2
.....	4.5	18	7.5	76	417	176	153	54	a 10	4	2	2
.....	4.5	12	7.5	87	270	168	139	50	9	4	2	a 2
.....	4.5	7.5	41	364	199	168	125	45	9	a 4	2	2
.....	4.5	7.5	25	270	168	153	112	45	9	4	2	2
.....	4.5	7.5	60	475	139	139	106	50	11	4	a 2	2
.....	4.5	9.8	70	810	125	125	112	45	9	4	2	2
.....	4.5	12	41	338	112	112	99	a 42	9	4	2	2
.....	4.5	46	25	160	112	99	93	a 39	7	4	2	2
.....	4.5	a 29	18	168	112	87	87	36	7	3.2	2	a 2
.....	4.5	12	18	139	.....	82	87	a 36	7	3.2	2	a 2
.....	4.5	12	118	125	.....	76	93	36	7	3.2	2	a 2
.....	4.5	.....	1,220	112	.....	70	.....	36	.....	a 3.1	2	.....

NOTE.—Discharge determined from two fairly well defined rating curves applicable Oct. 1 to Dec. 31 and Jan. 1 to Sept. 30.

a Gage not read.

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Monthly discharge of Goodyear Creek at Goodyear Bar, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	4.5	3.5	4.18	257	D.
November	46	6	12.4	738	C.
December	1,220	7.5	58.5	3,600	C.
January	810	76	206	12,700	C.
February	417	60	110	6,110	B.
March	176	70	131	8,060	B.
April	338	65	138	8,210	B.
May	132	36	74.6	4,590	B.
June	36	7	16.1	958	C.
July	7	3.1	4.81	296	D.
August	3	2	2.26	139	D.
September	2	2	2.0	119	D.
The year	1,220	2	63.2	45,800	

OREGON CREEK NEAR NORTH SAN JUAN, CAL.

LOCATION.—In the N. ½ SE. ¼ sec. 28, T. 18 N., R. 8 E., below highway bridge, 500 feet above junction with Middle Fork of Yuba River, half a mile above Freemans Crossing, and 2 miles northeast of North San Juan.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 28, 1910, to September 30, 1914.

GAGE.—Vertical staff fastened to an alder tree on right bank 150 feet below bridge. Observer, Henry Zurhorst.

DISCHARGE MEASUREMENTS.—Made from cable 30 feet below gage or by wading.

CHANNEL AND CONTROL.—Small boulders and gravel; shifts during high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 8.5 feet at 5 p. m. December 31 (approximate discharge, computed from extension of rating curve, 4,100 second-feet); minimum discharge recorded, 2.5 second-feet August 12 to 18.

1910–1914: Maximum stage recorded, 8.5 feet at 5 p. m. December 31, 1913 (approximate discharge, computed from extension of rating curve, 4,100 second-feet; minimum discharge recorded, 2 second-feet during parts of August and September, 1913.

ACCURACY.—Rating curves fairly well defined; results fair; estimates for high water based upon flood measurements made in 1915.

Discharge measurements of Oregon Creek near North San Juan, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 17	Charles Leidl	5.55	460	Feb. 6	H. J. Tompkins	4.66	170
18	....do	5.59	520				

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charge, in second-feet, of Oregon Creek near North San Juan, Cal., for the year ending Sept. 30, 1914.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
....	3	5.5	13	1,280	285	255	77	74	30	12	4	3.5
....	3	18	12	1,650	245	255	77	69	25	11	4	4
....	3	6.5	9	840	228	210	77	77	25	11	3.5	4
....	3	5.5	9	510	195	192	87	77	25	11	3.5	4
....	3	5.5	9	330	180	192	175	74	23	10	3.5	4
....	3	13	8	271	168	182	145	69	21	10	3.5	4
....	3	7.5	8	258	160	175	145	69	47	10	3.5	4
....	3	6.5	8	235	142	203	120	69	35	9	3	4
....	3	5	5	203	142	192	175	69	30	8	3	3.5
....	3	5	6.5	178	135	182	300	61	27	8	3	3.5
....	3	8	10	136	142	182	300	58	25	8	3	3
....	3.5	10	8	130	135	175	232	54	23	7	2.5	3
....	3.5	9	22	445	130	175	210	50	21	7	2.5	3.5
....	3.5	8	19	665	130	175	210	47	21	7	2.5	3.5
....	3.5	8	13	510	130	160	278	47	21	7	2.5	3.5
....	3.5	6.5	13	330	126	160	210	45	17	7	2.5	4
....	3.5	5.5	12	478	135	169	175	41	17	7	2.5	4
....	3.5	5.5	10	510	204	169	151	37	17	7	2.5	4
....	3.5	25	10	330	560	175	145	35	17	7	3	4
....	3.5	25	9	235	1,230	160	145	35	17	6.5	3	4
....	3.5	25	12	235	1,600	160	140	35	16	6.5	3	4
....	3	13	270	1,520	780	145	120	35	14	6.5	3	4
....	3	16	62	1,280	535	145	132	45	14	6.5	3	4
....	2.5	8	43	1,910	435	140	97	45	23	6.5	3	4
....	2.5	13	320	2,740	378	132	77	77	19	6.5	3	4
....	2.5	13	177	1,600	340	120	77	61	17	5.5	3	4
....	2.5	79	70	800	278	97	77	47	17	5.5	3	4
....	2.5	25	49	630	255	97	69	41	14	4.5	3.5	4
....	3	25	43	495	.....	93	77	35	14	4.5	3.5	4
....	3.5	14	159	380	.....	87	77	35	12	4.5	3.5	4
....	3.5	.....	3,120	330	.....	87	.....	33	.....	4	3.5	.....

Discharge determined from several fairly well defined rating curves. Discharge Mar. 9 interpo-

discharge of Oregon Creek near North San Juan, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
.....	3.5	2.5	3.11	191	D.
.....	79	5	14.0	833	D.
.....	3,120	5	146	8,980	C.
.....	2,740	130	692	42,500	C.
.....	1,600	126	336	18,700	C.
.....	255	87	163	10,000	C.
.....	300	69	146	8,690	C.
.....	77	33	53.1	3,260	C.
.....	47	12	21.5	1,280	C.
.....	12	4	7.47	459	D.
.....	4	2.5	3.10	191	D.
.....	4	3	3.83	228	D.
Year	3,120	2.5	132	95,300	

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BEAR RIVER NEAR COLFAX, CAL.

LOCATION.—In sec. 22, T. 15 N., R. 9 E., at Pacific Gas & Electric Co.'s diversion dam about half a mile below mouth of Greenhorn River, and 3 miles north of Colfax.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—November 1, 1911, to September 30, 1914. Records show flow over dam only.

GAGE.—Staff in three sections on left bank No. 1, vertical, on post in forebay of canal, in line with crest; No. 2, inclined, fastened to tree 50 feet above dam; No. 3, vertical, on stump 4 feet below No. 2. A vertical staff for low water has been installed on right bank 25 feet above dam.

DISCHARGE MEASUREMENTS.—Made from cable 500 feet above dam or by wading.

CHANNEL AND CONTROL.—Gravel and shifting. Dam forms part of the control but discharge is affected by flow in canal.

EXTREMES OF STAGE.—Maximum stage recorded during year, 7.3 feet February 22, but exceeded 7.3 feet January 24, 25, 26, and February 21; minimum gage height recorded gives no indication of discharge owing to conditions at the dam.

1911–1914: Maximum stage recorded 7.3 February 22, 1914, over 7.3 feet January 24, 25, 26, and February 21, 1914; minimum discharge recorded, 5 second-feet November 5, 7, 9, 1912.

DIVERSIONS AND STORAGE.—A small amount of storage has been developed above the station. Stored water from South Fork of Yuba River is diverted into this drainage basin above the station.

ACCURACY.—Conditions at the station considerably changed by the work of enlarging the power canal begun on intake October 29, 1913; discharge measurements insufficient to cover these changes and the range of stage; estimates not prepared. Discharge of Bear River canal must be included to obtain total flow of river.

COOPERATION.—Gage-height record furnished by Pacific Gas & Electric Co.

Discharge measurements of Bear River and Bear River canal near Colfax, Cal., during the year ending Sept. 30, 1914.

[Made by Charles Leidl.]

Date.	Discharge at cable above dam.	Discharge wasted from canal above canal gage.	Discharge of canal.	Gage height at dam (left bank).	Discharge over dam.
	Sec.-ft.	*Sec.-ft.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
Jan. 15 [a]	1,070	(b)	0	5.62	(b)
Apr. 18 [c]	444	0	44	5.56	400
June 20 [d]	158	[e] 69	89	(f)	0
Sept. 5 [g]	274	0	87	5.86	187

[a] Measured at cable.
[b] Water wasted through sand gates not measured and, therefore, discharge over dam not known.
[c] Measured by wading 800 feet above gage and dam.
[d] Measured by wading 800 feet below dam.
[e] This amount passing through sand gates.
[f] Water drawn down below minimum reading of gage and crest of dam.
[g] Measured by wading 600 feet below dam.

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Daily gage height, in feet, of Bear River near Colfax, Cal., for the year ending Sept. 30, 1914.

[Charles Hund, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	5.4	5.45	5.45	.....	6.45	6.3	5.5	5.55	5.6	5.95	.....	5.6
2	5.4	5.45	5.4	6.9	6.3	6.25	5.65	5.55	5.6	5.85	5.6	5.7
3	5.5	5.35	5.45	6.4	6.2	6.1	5.65	5.55	5.5	5.75	5.6	5.55
4	5.4	5.35	5.45	5.8	6.15	5.95	5.75	5.65	5.5	5.65	5.85	5.6
5	5.3	5.35	5.4	5.75	6.05	6.0	5.75	5.6	5.5	5.75	5.8	5.7
6	5.35	5.4	5.4	5.5	5.95	5.75	5.65	5.45	5.65	5.8	5.7	5.45
7	5.4	5.35	5.4	5.6	5.85	5.8	5.7	5.5	5.8	5.8	5.75	5.6
8	5.4	5.35	5.45	5.65	5.8	5.85	5.65	5.55	5.4	6.05	5.75	5.65
9	5.4	5.3	5.5	5.55	5.75	5.95	6.05	5.45	5.6	5.1	5.65	5.75
10	5.4	5.35.	5.4	5.45	5.8	5.9	6.05	5.5	5.6	.....	5.55	5.75
11	5.4	5.5	5.35	5.4	5.75	5.9	5.85	5.65	5.6	.....	5.65	5.65
12	5.4	5.65	5.45	5.6	5.7	5.7	5.65	5.5	5.55	.....	5.6	5.75
13	5.45	5.45	5.45	6.4	5.7	5.75	5.6	5.5	5.6	.....	5.7	5.65
14	5.45	5.4	5.45	6.85	5.65	5.7	5.6	5.45	5.6	.....	5.8	5.6
15	5.45	5.3	5.35	6.65	5.75	5.75	5.7	5.45	5.55	.....	5.65	5.85
16	5.45	5.3	5.3	6.2	5.7	5.75	5.7	5.5	5.5	.....	5.8	5.85
17	5.45	5.3	5.25	6.6	5.7	5.7	5.6	5.6	5.65	.....	5.55	5.7
18	5.45	5.25	5.25	6.7	6.0	5.65	5.5	5.65	5.6	.....	5.65	5.75
19	5.45	5.3	5.25	5.8	6.65	5.7	5.65	5.5	5.65	.....	5.7	5.65
20	5.4	5.55	5.25	6.4	7.25	5.7	5.55	5.5	5.6	.....	5.7	5.7
21	5.4	5.55	5.25	6.5	(a)	5.65	5.65	5.6	5.7	.....	5.7	5.7
22	5.4	5.5	6.15	(a)	7.3	5.5	5.65	5.4	5.6	.....	5.65	5.65
23	5.45	5.35	6.35	7.15	7.1	5.65	5.7	5.75	5.7	.....	5.6	5.8
24	5.4	5.4	6.4	(a)	6.9	5.75	5.65	5.6	6.05	.....	5.65	5.7
25	5.4	5.4	6.95	(a)	6.85	5.6	5.6	5.65	5.8	.....	5.55	5.8
26	5.4	5.45	6.55	(a)	6.5	5.55	5.6	5.55	5.75	.....	5.7	5.85
27	5.4	5.55	6.35	7.25	6.25	5.6	5.6	5.6	5.85	.....	5.7	5.65
28	5.4	5.5	6.3	7.2	6.2	5.6	5.6	5.55	5.8	.....	5.55	5.75
29	5.4	5.5	6.15	6.85	.....	5.8	5.6	5.45	5.75	.....	5.65	5.8
30	5.35	5.45	6.3	6.8	.....	5.8	5.65	5.55	5.75	.....	5.55	5.75
31	5.35	.....	(a)	6.7	.....	5.75	.....	5.6	.....	.....	5.6	.....

a Water over top of gage.

NOTE.—Right-bank gage read Oct. 1 to Dec. 21, 1913. Relation of gage height to discharge Oct. 29 to Dec. 21, 1913, affected by a wing dam constructed across the intake to the Pacific Gas & Electric Co.'s canal while head gates were being repaired. From Dec. 30, 1913, to Jan. 20, 1914, June 18–21, 1914, and July 10 to Aug. 1, 1914, the sand gates at intake to canal were open and the water was passed around the dam into the canal and through the sand gates; during the last period the water was thus drawn down below the minimum reading of the gage.

BEAR RIVER CANAL[1] NEAR COLFAX, CAL.

LOCATION.—In sec. 22, T. 15 N., R. 9 E., 750 feet below head gate at diversion dam, about 3 miles north of Colfax.

RECORDS AVAILABLE.—January 1, 1912, to September 30, 1914.

GAGE.—Float in stilling box on right side of flume about 40 feet below spillway. Observer, Charles Hund.

DISCHARGE MEASUREMENTS.—Made from foot plank across flume at gage.

COOPERATION.—Complete record furnished by Pacific Gas & Electric Co. Record does not show amount of water wasted through sand gates.

Discharge measurements of Bear River canal near Colfax, Cal., during the year ending Sept. 30, 1914.

[Made by Charles Leidl.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Jan. 15	.....	0	June 20	2.27	89
Apr. 18	1.41	44	Sept. 5	2.43	87

[1] Formerly published as Pacific Gas & Electric Co.'s canal.

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Daily discharge, in second-feet, of Bear River canal near Colfax, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	54	.....	.....	27	59	76	77	107	[illegible]
2	47	.....	.....	26	60	77	77	90	[illegible]
3	40	.....	.....	27	59	77	77	91	[illegible]
4	42	.....	.....	27	60	77	77	91	[illegible]
5	34	.....	.....	28	60	76	77	92	[illegible]
6	48	.....	.....	28	60	76	77	92	[illegible]
7	10.3	.....	.....	28	60	77	77	91	[illegible]
8	10.5	.....	.....	28	60	76	110	93	[illegible]
9	10.5	.....	.....	28	63	76	117	93	[illegible]
10	10.5	.....	.....	[b] 0	66	76	104	93	[illegible]
11	10.5	25	.....	0	70	76	81	94	[illegible]
12	(a)	25	.....	0	72	76	81	93	[illegible]
13	.....	25	27	0	72	81	76	92	[illegible]
14	.....	25	27	0	72	83	104	93	[illegible]
15	.....	25	27	0	72	104	123	93	[illegible]
16	.....	25	26	0	72	104	141	93	[illegible]
17	.....	25	27	26	72	102	143	92	[illegible]
18	.....	25	26	40	74	76	137	93	[illegible]
19	.....	25	27	40	75	76	171	94	[illegible]
20	.....	25	26	40	75	77	114	94	[illegible]
21	.....	25	26	44	76	67	107	94	[illegible]
22	.....	.....	27	48	75	75	114	93	[illegible]
23	.....	.....	27	53	76	77	108	94	[illegible]
24	.....	.....	27	56	75	77	113	92	[illegible]
25	.....	.....	26	60	75	77	107	92	[illegible]
26	.....	.....	27	60	75	76	116	93	71
27	.....	.....	26	60	74	77	116	94	70
28	.....	.....	27	60	76	76	114	94	70
29	.....	.....	27	60	76	77	101	94	71
30	.....	.....	27	60	76	77	100	93	71
31	.....	.....	27	.....	76	.....	100	88	.....

[a] Canal out of service; undergoing enlargement.
[b] Water out during repairs.

Monthly discharge of Bear River canal near Colfax, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
March 13–31	27	26	26.7	1,010
April	60	0	31.8	1,890
May	76	59	69.8	4,290
June	104	67	79.2	4,710
July	171	76	104	6,400
August	107	88	93.1	5,720
September	94	70	89.7	5,340
The period	.....	.....	.....	29,400

NOTE.—Monthly discharge computed by engineers of U. S. Geological Survey.

BEAR RIVER AT VAN TRENT, CAL.

LOCATION.—In the SE. ¼ sec. 21, T. 14 N., R. 6 E., below highway bridge at McCourtney crossing, 1 mile below Van Trent and 8 miles northeast of Wheatland.

DRAINAGE AREA.—263 square miles.

RECORDS AVAILABLE.—October 8, 1904, to September 30, 1914.

GAGE.—Staff in five sections on left bank 500 feet below bridge. Observer, Hermann Ernestus.

DISCHARGE MEASUREMENTS.—Made by wading or from cable half a mile below gage.

CHANNEL AND CONTROL.—Solid rock, boulders, and gravel; shifts during high water.

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EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 13.5 feet at 9 a. m. December 31 (discharge, 17,000 second-feet); minimum stage recorded, 0.9 foot at 9 a. m. October 7 (discharge, 13 second-feet).

1904–1914: Maximum stage recorded, 18.9 feet at 8 a. m. January 14, 1909 (approximate discharge, computed from extension of rating curve, 29,600 second-feet); minimum stage recorded, 0.8 foot August 28, 1913 (discharge, 8 second-feet).

DIVERSIONS AND STORAGE.—Water is diverted above station for power and irrigation. A small amount of storage is developed on the headwaters of this stream. Stored water from South Fork of Yuba River is diverted into this drainage basin above the station at Colfax.

ACCURACY.—Results good at medium and low stages; estimates for extremely high water are approximate, as rating curve is not well defined.

Discharge measurements of Bear River at Van Trent, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Jan. 29	R. C. Rice	5.08	2,010	June 22	Charles Leidl	1.78	232
Feb. 26	Charles Leidl	4.39	1,700	Sept. 8	do	1.74	209
Apr. 19	do	2.45	448				

Daily discharge, in second-feet, of Bear River at Van Trent, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	23	32	86	11,700	1,340	1,340	635	320	230	205	160	130
2	16	94	77	4,540	1,200	1,270	560	355	120	205	140	160
3	19	56	70	3,180	1,060	1,200	538	305	130	160	140	111
4	23	49	77	2,200	1,000	1,060	610	290	120	170	86	140
5	19	62	62	1,690	940	1,000	940	355	120	160	111	140
6	16	56	62	1,480	880	940	635	290	111	180	180	205
7	13	56	56	1,340	820	1,000	585	260	470	140	72	66
8	16	49	49	1,550	820	940	635	260	338	150	192	180
9	16	43	62	1,270	765	880	660	260	160	170	230	150
10	16	37	94	1,060	685	880	1,270	320	120	180	130	192
11	16	49	70	940	710	940	820	290	150	120	160	160
12	19	112	70	820	710	820	765	290	170	205	102	180
13	23	77	168	2,050	710	710	765	230	140	180	130	180
14	23	62	144	9,460	710	820	610	290	120	102	120	102
15	19	49	94	4,170	710	820	610	290	180	79	192	192
16	23	49	94	2,120	685	710	635	180	140	66	150	260
17	23	43	77	4,050	820	710	560	230	120	120	160	180
18	23	49	56	6,630	1,000	660	515	180	150	160	120	205
19	23	112	49	3,180	4,670	710	450	260	102	160	150	180
20	23	62	70	2,050	5,510	710	470	260	260	170	160	170
21	23	112	62	1,620	11,900	685	430	230	120	130	140	86
22	23	77	1,230	11,000	5,070	685	492	290	245	120	160	180
23	27	62	705	3,820	3,820	585	538	290	102	102	130	218
24	27	56	375	11,000	2,700	685	390	430	111	102	111	205
25	27	56	2,240	5,070	2,200	660	410	355	290	102	160	140
26	27	56	1,300	8,650	1,760	610	430	390	120	94	160	160
27	27	205	455	3,710	1,550	585	338	320	111	140	192	192
28	23	155	300	2,620	1,410	560	372	338	160	102	160	120
29	23	103	220	2,120	.....	538	410	180	230	160	102	180
30	27	132	375	1,830	.....	765	338	160	102	140	160	230
31	27	.....	17,000	1,550	.....	710	.....	290	.....	160	60	.....

NOTE.—Discharge determined as follows: Oct. 1 to Dec. 31, 1913, from a rating curve well defined below 4,000 second-feet and fairly well defined up to 4,000 second-feet; Jan. 1 to Sept. 30, 1914, from a curve fairly well defined between 160 and 4,000 second-feet.

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Monthly discharge of Bear River at Van Trent, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	27	13	21.7	1,330	B.
November	205	32	73.7	4,390	A.
December	17,000	49	834	51,300	C.
January	11,700	820	3,820	235,000	C.
February	11,900	685	2,010	112,000	C.
March	1,340	538	813	50,000	B.
April	1,270	338	581	34,600	B.
May	430	160	283	17,400	B.
June	470	102	168	10,000	B.
July	205	66	143	8,790	C.
August	230	60	143	8,790	C.
September	260	66	166	9,880	B.
The year	17,000	13	750	543,000	

NORTH FORK OF AMERICAN RIVER NEAR COLFAX, CAL.

LOCATION.—In the SW. ¼ sec. 30, T. 14 N., R. 10 E., at bridge on Colfax-Forest Hill road, 150 feet below mouth of Shirttail Canyon Creek, 11 miles above junction with the Middle Fork, and 5 miles southeast of Colfax.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 16, 1911, to September 30, 1914.

GAGE.—Gurley electric water-stage recorder on right bank, 50 feet below bridge, with an auxiliary vertical staff in two sections about 30 feet below bridge; low-water section is on left bank and high-water on right bank. Both gages are at same datum.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Gravel and small boulders—tailings from placer mining; shifts during high water.

EXTREMES OF DISCHARGE.—Maximum stage during year, determined by high-water mark on the gage in gage well, 16.0 feet during morning of January 1 (approximate discharge, computed from extension of rating curve, 23,000 second-feet); minimum stage recorded, 2.02 feet September 21 (discharge, 58 second-feet).

1911–1914: Maximum stage, 16.0 feet during morning of January 1, 1914, determined by high-water mark on gage in gage well (approximate discharge, computed from extension of rating curve, 23,000 second-feet); minimum stage from automatic gage record, 3.12 feet September 24, 1913 (discharge, 51 second-feet).

DIVERSIONS.—A small ditch on the headwaters of the North Fork diverts water above the station.

ACCURACY.—Rating curves fairly well defined; results good.

Discharge measurements of North Fork of American River near Colfax, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Nov. 6	Lasley Lee	3.27	98	Apr. 18	Charles Leidl	5.42	2,170
Jan. 15	Charles Leidl	6.31	2,890	June 20	.....do	4.30	1,210
Mar. 1	.....do	4.98	1,690	Sept. 5	.....do	2.08	66
27	Lasley Lee	4.57	1,360				

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Daily discharge, in second-feet, of North Fork of American River near Colfax, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	63	.....	114	8,940	.....	1,780	1,020	1,350	2,120	570	115	70
2	60	.....	103	8,720	.....	1,730	985	1,680	1,970	515	102	69
3	60	.....	96	.....	.....	1,600	1,120	2,180	1,680	490	102	68
4	57	.....	92	.....	.....	1,470	1,470	2,400	1,550	440	102	68
5	57	.....	82	.....	.....	1,510	2,460	2,400	1,350	392	102	67
6	.....	100	82	.....	.....	1,550	2,020	2,280	1,060	370	102	67
7	.....	103	78	.....	.....	1,640	1,920	2,400	1,090	348	102	67
8	.....	78	78	.....	.....	1,680	1,820	2,580	950	348	115	67
9	.....	63	75	.....	.....	1,680	2,850	2,340	866	305	90	67
0	.....	60	75	.....	.....	1,680	5,150	1,820	901	285	90	67
1	.....	118	75	.....	.....	1,640	2,580	1,820	1,020	285	80	67
2	.....	230	72	.....	.....	1,730	2,120	2,070	1,090	285	80	67
3	.....	134	138	1,240	.....	1,730	2,070	2,280	1,090	265	80	67
4	.....	106	122	3,540	.....	1,640	2,280	2,280	1,120	245	80	67
5	.....	96	96	2,570	.....	1,550	3,140	2,400	1,200	245	80	67
6	.....	86	92	2,420	.....	1,730	2,850	2,230	1,230	228	80	67
7	.....	78	86	2,720	.....	1,970	2,120	2,070	1,230	228	79	67
8	.....	106	80	4,080	.....	2,120	2,180	2,120	1,200	210	79	67
9	.....	118	78	.....	.....	2,120	2,640	2,070	1,310	210	78	67
0	.....	126	78	.....	.....	1,920	2,780	2,120	1,230	192	77	67
1	.....	154	78	.....	.....	1,870	2,180	2,400	1,020	192	77	58
2	.....	114	356	.....	.....	2,020	1,780	2,280	810	175	76	62
3	.....	92	235	.....	.....	2,070	1,310	2,120	745	160	75	62
4	.....	82	235	.....	.....	1,820	1,350	2,120	1,020	160	75	62
5	.....	92	449	.....	.....	1,550	1,270	2,340	880	160	74	62
6	.....	100	.....	.....	.....	1,470	1,270	1,730	685	145	74	62
7	.....	295	.....	.....	.....	1,350	1,230	1,730	625	130	73	62
8	.....	205	356	.....	1,640	1,230	1,200	1,730	598	130	72	62
9	.....	150	317	.....	.....	1,230	1,120	1,870	598	130	72	62
0	.....	134	432	.....	.....	1,120	1,160	2,180	570	130	71	62
1	.....	.....	.....	.....	.....	1,060	.....	2,230	.....	115	70	.....

NOTE.—Discharge estimated Oct. 6-31 at 55 second-feet, and Nov. 1-5, 75 second-feet, by comparison with record of discharge of Middle Fork of American River near East Auburn, Cal. Discharge interpolated Aug. 17 to Sept. 4 and Sept. 6-19. No record Oct. 6 to Nov. 5, Dec. 26, 27, and 31, Jan. 3-12, Jan. 19 to Feb. 7, Aug. 17 to Sept. 4, and Sept. 6-19; rise in stage Dec. 26, 27, and 31.

Monthly discharge of North Fork of American River near Colfax, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	63	.....	55.7	3,420	
November	295	60	113	6,720	B.
March	2,120	1,060	1,650	101,000	A.
April	5,150	985	1,980	118,000	A.
May	2,580	1,350	2,120	130,000	A.
June	2,120	570	1,090	64,900	A.
July	570	115	261	16,000	B.
August	115	70	84.6	5,200	C.
September	70	58	65.4	3,890	C.

AMERICAN RIVER AT FAIROAKS, CAL.

LOCATION.—At highway bridge 1,500 feet northwest of Southern Pacific Co.'s station at Fairoaks Bridge, half a mile southeast of Fairoaks, and 10 miles below mouth of South Fork.

DRAINAGE AREA.—1,910 square miles.

RECORDS AVAILABLE.—November 3, 1904, to September 30, 1914.

GAGE.—Painted on right bridge pier near downstream end, with a vertical staff for low water. The position of the gage has been changed several times since the station was established, but no change has been made in its datum. January 18, 1914, a Gurley electric water-stage recorder was installed on right bank 800 feet below bridge; auxiliary vertical staff in six sections at same site. All gages set at *same datum.*

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DISCHARGE MEASUREMENTS.—Made from downstream side of bridge or by wading.

CHANNEL AND CONTROL.—Gravel and small boulders; shifts slightly during high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 20.7 feet at 8 a. m. January 1 (discharge, 74,100 second-feet); minimum stage recorded, 1.30 feet at 9 a. m. October 1 and 13 (discharge, 60 second-feet).

1907–1914: Maximum stage recorded, 30.4 feet March 19, 1907 (discharge, 119,000 second-feet); minimum stage recorded, 1.30 feet at 9 a. m. October 1 and 13, 1913 (discharge, 60 second-feet).

STORAGE AND REGULATION.—See description of South Fork (p. 270). Low-water flow partly regulated by power plant at Folsom. Water diverted for irrigation above station.

ACCURACY.—Rating curves fairly well defined; results good.

Discharge measurements of American River at Fairoaks, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.[a]	Gage height.[b]	Discharge.	Date.	Made by—	Gage height.[a]	Gage height.[b]	Discharge.
		Feet.	*Feet.*	*Sec.-ft.*			*Feet.*	*Feet.*	*Sec.-ft.*
Nov. 16	F. C. Ebert	2.38	.....	473	Feb. 11	Charles Leidl	5.66	5.44	3,[illegible]
Jan. 2	Lasley Lee	10.95	.....	23,300	21	....do	14.60	14.02	41,[illegible]
7	....do	6.02	.....	5,070	Apr. 16	....do	9.52	8.98	17,[illegible]
21	....do	6.61	.....	7,060	June 19	....do	6.80	6.41	8,[illegible]
22	....do	16.40	15.62	51,600	26	....do	5.60	5.29	4,[illegible]
30	R. C. Rice	8.14	7.72	10,600	Aug. 31	....do	.....	1.98	[illegible]

[a] Gage at bridge. [b] Water-stage recorder installed below bridge Jan. 18, 1914.

Daily discharge, in second-feet, of American River at Fairoaks, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	85	125	639	57,700	7,840	8,280	6,740	6,530	[a]8,760	4,130	830	195
2	140	330	552	24,500	6,900	8,280	[a]6,240	7,960	[a]8,340	3,930	790	190
3	195	240	474	19,500	6,300	7,660	5,750	10,300	[a]7,930	3,740	736	190
4	155	240	463	11,300	5,740	7,360	5,960	12,500	[a]7,510	3,640	700	217
5	195	240	468	7,960	5,480	7,360	[a]8,880	13,200	[a]7,090	3,370	700	190
6	125	330	380	6,280	4,960	7,660	11,800	12,800	[a]6,680	3,020	655	212
7	195	285	370	5,300	4,720	[a]7,440	6,740	12,800	6,260	2,940	628	195
8	125	430	380	6,540	4,240	[a]7,230	6,740	14,400	[a]6,380	2,770	594	190
9	195	330	330	5,540	4,240	7,010	6,740	14,400	[a]6,490	2,530	602	177
10	155	330	370	4,620	4,020	[a]7,860	[a]8,290	11,400	[a]6,610	2,380	530	217
11	240	316	375	4,000	3,800	8,700	[a]9,850	10,300	[a]6,730	2,230	514	190
12	155	540	360	3,800	3,800	[a]7,800	11,400	11,400	[a]6,840	3,160	498	182
13	125	863	405	6,800	3,800	[a]8,700	[a]12,400	12,500	[a]6,960	2,020	436	182
14	110	606	849	17,000	3,180	[a]8,700	[a]13,300	11,700	[a]7,080	2,020	450	164
15	140	524	652	17,400	3,010	[a]8,700	[a]14,200	13,600	[a]7,190	1,880	466	168
16	125	430	540	9,560	[a]3,010	8,700	15,200	14,000	[a]7,310	1,880	429	159
17	140	410	496	10,600	3,010	9,290	12,100	11,700	[a]7,430	1,820	394	164
18	110	452	485	20,000	3,180	[a]9,290	11,400	12,500	[a]7,540	1,790	366	190
19	95	534	458	11,500	5,540	9,290	13,200	12,100	7,660	1,740	338	177
20	240	558	490	8,000	8,050	[a]9,290	16,000	12,100	[a]7,370	1,610	338	217
21	285	665	496	6,800	42,600	9,290	12,500	12,500	7,080	1,550	324	206
22	195	650	600	36,500	8,000	[a]9,290	10,300	14,000	[a]6,670	1,450	324	186
23	240	534	2,370	25,600	3,620	[a]9,290	8,920	11,700	[a]6,260	1,340	345	195
24	240	436	1,430	30,700	[a]7,510	9,290	7,660	12,100	[a]5,840	1,260	310	[a]195
25	110	452	2,720	42,500	11,400	8,920	7,080	[a]11,700	[a]5,430	1,200	298	[a]195
26	95	458	4,420	52,600	10,600	[a]8,320	7,360	[a]11,300	5,020	1,170	274	[a]195
27	110	552	2,200	28,600	9,260	[a]7,720	6,800	[a]10,800	4,340	1,090	268	[a]195
28	155	1,140	1,430	18,500	8,600	[a]7,130	6,800	[a]10,400	4,340	1,030	228	[a]195
29	110	835	1,250	11,200	.....	6,530	6,260	[a]10,000	4,340	990	190	[a]195
30	125	758	1,370	10,500	.....	5,960	6,000	[a]9,600	4,340	950	217	[a]195
31	95	.....	38,800	9,120	.....	4,280	.....	[a]9,180	.....	890	206	.....

[a] Interpolated.

NOTE.—Discharge determined from fairly well defined rating curves. Discharge estimated Feb. 22, 1914.

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Monthly discharge of American River at Fairoaks, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	285	85	155	9,530	C.
November	1,140	125	487	29,000	B.
December	38,800	330	2,150	132,000	B.
January	57,700	3,800	17,100	1,050,000	B.
February	42,600	3,010	7,010	389,000	B.
March	9,290	4,280	8,110	499,000	B.
April	16,000	5,750	9,420	561,000	B.
May	14,400	6,530	11,700	719,000	A.
June	8,760	4,340	6,590	392,000	B.
July	4,130	890	2,110	130,000	A.
August	830	190	451	27,700	A.
September	217	159	191	11,400	A.
The year	57,700	85	5,460	3,950,000	

MIDDLE FORK OF AMERICAN RIVER NEAR EAST AUBURN, CAL.

LOCATION.—In the SE. ¼ sec. 6, T. 12 N., R. 9 E., at the Mountain Quarry plant of the Pacific Portland Cement Co., Consolidated, about 1½ miles above the junction with North Fork of American River and 3½ miles northeast of Auburn.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 22, 1911, to September 30, 1914.

GAGE.—Staff in three sections on left bank at pump house. Observer, H. M. Powers.

DISCHARGE MEASUREMENTS.—The cable 300 feet below gage was destroyed by flood in January, 1914. Since that time measurements have been made from a cable 1 mile above gage.

CHANNEL AND CONTROL.—Gravel and small boulders; shifts during high water.

EXTREMES OF DISCHARGE.—1911–1914: Maximum stage recorded, 18.0 feet January 1, 1914 (discharge, 26,400 second-feet); minimum stage recorded, 1.30 feet September 30, 1914 (discharge, 58 second-feet).

ACCURACY.—Rating curves fairly well defined; results good.

Discharge measurements of Middle Fork of American River near East Auburn, Cal., during the year ending Sept. 30, 1914.

[Made by Charles Leidl.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Apr. 17	7.38	5,120	Sept. 6	1.72	94
June 21	5.79	2,980			

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Daily discharge, in second-feet, of Middle Fork of American River near East Auburn, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	71	67	269	26,400	4,470	2,100	3,640	6,100	5,460	1,610	315	70
2	71	74	269	10,600	3,250	1,900	3,910	6,100	5,030	1,610	278	70
3	71	84	234	6,100	2,640	1,700	3,910	5,940	4,890	1,440	278	79
4	71	95	203	3,770	2,200	1,610	6,590	5,780	4,610	1,440	242	79
5	71	95	203	3,250	2,000	1,440	4,890	5,940	4,750	1,520	242	79
6	71	95	203	2,640	2,000	1,440	4,750	5,780	4,330	1,440	242	78
7	71	84	203	2,420	1,800	1,520	5,030	5,460	4,610	1,270	242	78
8	71	110	203	2,530	1,610	1,610	5,170	5,780	4,750	1,200	242	78
9	71	110	176	2,420	1,610	1,610	5,170	5,460	4,330	1,120	210	78
10	71	128	176	1,900	1,520	1,800	12,600	5,940	3,770	1,120	210	78
11	71	128	203	1,350	1,520	1,800	8,890	5,780	3,910	1,040	210	70
12	71	176	203	1,350	1,350	2,000	8,700	5,780	3,770	975	154	70
13	71	203	269	2,200	1,200	2,000	8,160	5,620	4,470	1,040	154	70
14	70	203	269	8,700	1,040	2,100	8,160	5,620	4,050	905	154	70
15	70	203	269	3,910	905	2,100	7,440	5,780	3,770	905	108	70
16	70	176	269	3,250	975	2,100	7,270	5,940	3,250	905	108	70
17	70	203	348	5,030	1,350	2,200	7,270	5,780	3,380	840	91	70
18	70	234	348	7,800	2,760	2,420	7,440	5,460	3,000	775	108	70
19	70	234	348	3,910	6,260	2,310	7,440	5,310	2,760	775	91	70
20	70	234	484	3,120	15,600	2,530	7,100	5,620	2,880	715	91	69
21	69	234	484	7,800	7,800	2,640	6,930	5,310	2,530	600	108	69
22	69	234	590	19,800	8,160	2,880	7,100	5,310	2,310	655	91	69
23	68	269	645	15,600	6,590	3,120	7,270	4,890	2,200	545	79	69
24	68	269	645	13,600	5,310	3,250	7,440	5,780	2,000	545	79	69
25	68	234	645	24,200	4,190	3,380	7,620	5,460	2,100	495	79	58
26	68	234	765	15,600	3,380	3,380	6,930	5,460	1,900	495	79	58
27	68	203	765	9,650	3,000	3,510	6,930	5,310	1,800	400	70	58
28	68	234	765	9,650	2,760	3,380	6,420	6,310	1,900	400	70	58
29	69	234	890	7,800	.....	3,250	6,420	5,170	1,700	400	70	58
30	68	307	890	6,420	.....	3,510	6,420	5,030	1,700	315	70	58
31	68	.....	17,700	5,460	.....	3,510	.....	5,460	.....	315	70	.....

NOTE.—Discharge Oct. 1, 1913, to Jan. 1, 1914, determined from a rating curve well defined below 7,000 second-feet; Jan. 2 to Sept. 30, 1914, from a rating curve fairly well defined below 7,000 second-feet.

Monthly discharge of Middle Fork of American River near East Auburn, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	71	68	69.8	4,290	B.
November	307	67	180	10,700	B.
December	17,700	176	966	59,400	B.
January	26,400	1,350	7,680	472,000	C.
February	15,600	905	3,470	193,000	B.
March	3,510	1,440	2,390	147,000	B.
April	12,600	3,640	6,770	403,000	B.
May	6,100	4,890	5,600	344,000	B.
June	5,460	1,700	3,400	202,000	B.
July	1,610	315	897	55,200	B.
August	315	70	150	9,220	B.
September	79	58	68.8	4,090	B.
The year	26,400	58	2,630	1,900,000	

RUBICON RIVER AT RUBICON SPRINGS, CAL.

LOCATION.—In the SE. ¼ sec. 31, T. 14 N., R. 16 E., at Rubicon Springs, about three-fourths mile above mouth of Millers Creek.

DRAINAGE AREA.—31.6 square miles.

RECORDS AVAILABLE.—February 1, 1910, to September 28, 1914, when station was discontinued (record incomplete).

GAGE.—Water-stage recorder.

DISCHARGE MEASUREMENTS.—Made from cable.

CHANNEL AND CONTROL.—Sand and gravel; fairly permanent.

EXTREMES OF DISCHARGE.—1910–1914: Maximum mean daily discharge, 1,240 second-feet June 19, 1911; no flow September 4 to 15, 1910.

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:R FLOW.—Stage-discharge relation affected by ice.

:ACY.—Results excellent except for winter months.

RATION.—Records of daily discharge furnished by Truckee River General lectric Co., through L. O. Murphy, engineer.

discharge, in second-feet, of Rubicon River at Rubicon Springs, Cal., for the year ending Sept. 30, 1914.

.	Oct.	Nov.	Dec.	Mar.	June.	Sept.	Day.	Oct.	Nov.	Dec.	Mar.	June.	Sept.
.....	2	0.5	20	.....	.....	.....	16.....	1	6	10	.....	.....	.....
.....	2	1	20	.....	.....	.....	17.....	1	6	10	.....	.....	.....
.....	2	2	20	.....	.....	.....	18.....	1	6	10	.....	.....	.....
.....	3	3	19	.....	.....	.....	19.....	1	6	10	.....	.....	.....
.....	3	4	17	.....	.....	.....	20.....	1	6	13	.....	.....	.....
.....	2	5	16	.....	.....	.....	21.....	1	6	9	.....	.....	.....
.....	2	6	16	.....	.....	.....	22.....	1	6	9	.....	.....	.....
.....	2	5	13	.....	.....	.....	23.....	1	9	12	.....	.....	.....
.....	2	6	15	.....	.....	.....	24.....	1	9	15	.....	.....	.....
.....	2	6	16	.....	.....	.....	25.....	1	9	22	.....	.....	.....
.....	2	6	14	.....	477	.....	26.....	1	19	21	.....	.....	.....
.....	2	6	14	.....	.....	.....	27.....	.5	20	18	.....	.....	.....
.....	1	6	13	.....	.....	.....	28.....	.5	22	15	.....	.....	4
.....	1	6	10	.....	.....	.....	29.....	.5	19	15	.....	.....	.....
.....	1	6	10	125	.....	.....	30.....	1	21	41	.....	.....	.....
							31.....	1	.....	580	.....	.....	.....

.—Discharge Dec. 21 to Mar. 31 estimated by the company as 10 per cent of that of Rubicon River, intette; stage-discharge relation affected by snow and ice; during February snow was 15 to 20 feet Buck Island Lake and from 15 inches to 6 feet deep at Rubicon Springs.

ly discharge of Rubicon River at Rubicon Springs, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 31.6 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
.....	3	0.5	1.40	0.044	0.05	86
ber.....	22	.5	7.95	.252	.28	473
ber.....	.....	.....	33.6	1.06	1.22	2,070
.....	.....	.....	a 118	3.73	4.30	7,260
y.....	.....	.....	a 75	2.37	2.47	4,200
.....	.....	.....	a 124	3.92	4.52	7,620
he period.....	.....	.....	.....	.....	.....	21,700

a Estimated by the company as 10 per cent of that of Rubicon River near Quintette.

.—Monthly discharge computed by engineers of the U. S. Geological Survey.

RUBICON RIVER NEAR QUINTETTE, CAL.

ION.—In the NW. ¼ SW. ¼ sec. 24, T. 13 N., R. 13 E., about 1 mile below mouth Little South Fork of Rubicon River, half a mile above trail crossing to Ellicott, id 11½ miles northeast of Quintette.

AGE AREA.—198 square miles.

DS AVAILABLE.—November 21, 1909, to June 8, 1914, when station was discontinued.

ARGE MEASUREMENTS.—Made from cable.

EL AND CONTROL.—In solid rock.

MES OF DISCHARGE.—1910–1914: Maximum mean daily discharge, 7,560 second-et November 21, 1909; minimum mean daily discharge, 5 second-feet September to 14, 1910.

ACY.—Results excellent.

RATION.—Records of daily discharge furnished by Truckee River General ectric Co., through L. O. Murphy, engineer.

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Daily discharge, in second-feet, of Rubicon River near Quintette, Cal., for the ending year Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	11	9	95	4,650	690	650	710	1,520	2,[illegible]
2	11	.....	88	2,850	610	690	670	2,050	2,[illegible]
3	11	.....	81	1,560	590	630	920	2,950	2,[illegible]
4	11	.....	68	970	530	610	1,490	3,060	2,[illegible]
5	11	.....	62	760	510	670	2,460	3,170	1,[illegible]
6	10	45	62	650	475	870	2,050	3,170	1,[illegible]
7	10	.....	62	690	450	1,050	1,830	2,950	1,[illegible]
8	10	.....	62	760	460	1,130	1,680	2,950	1,[illegible]
9	10	.....	62	530	445	1,160	2,650	2,850	.....
10	10	.....	62	460	450	1,150	4,050	2,250	.....
11	10	.....	56	435	445	1,160	2,130	2,460	.....
12	10	.....	56	410	450	1,250	1,750	2,950	.....
13	9	.....	81	690	445	1,270	1,970	2,800	.....
14	9	.....	102	825	450	1,220	2,370	3,170	.....
15	9	.....	102	610	460	1,370	3,610	3,610	.....
16	9	.....	102	530	460	1,520	2,750	3,060	.....
17	9	.....	102	530	460	1,860	2,050	2,850	.....
18	9	.....	110	490	530	2,010	2,200	2,850	.....
19	9	.....	102	460	650	1,980	2,950	2,850	.....
20	9	.....	102	435	1,250	1,830	2,900	2,950	.....
21	9	.....	88	450	2,330	1,780	2,200	3,390	.....
22	9	.....	88	2,050	1,900	1,790	1,680	2,850	.....
23	9	50	110	1,460	1,370	1,860	1,400	2,850	.....
24	9	74	143	1,680	970	1,620	1,180	2,370	.....
25	9	81	220	3,560	995	1,430	1,130	2,370	.....
26	9	81	206	2,550	1,050	1,220	1,220	2,050	.....
27	9	143	180	1,680	870	1,020	1,160	2,200	.....
28	9	143	152	1,240	670	970	1,050	2,370	.....
29	9	118	147	970	.....	945	945	2,750	.....
30	9	110	409	850	.....	895	1,080	3,170	.....
31	9	.....	5,800	760	.....	800	.....	3,170	.....

NOTE.—No record reported Nov. 2-4 and 7-22.

Monthly discharge of Rubicon River near Quintette, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	11	9	9.5	580
November	143	9	a 54	3,200
December	5,800	56	296	18,200
January	4,650	410	1,180	72,600
February	2,330	445	749	41,600
March	2,010	610	1,240	76,200
April	4,050	670	1,870	111,000
May	3,610	1,520	2,770	170,000
June 1-8	2,950	1,180	1,900	30,100
The period	.....	.....	.....	523,000

a Estimated by the company.

NOTE.—Monthly discharge computed by engineers of U. S. Geological Survey.

LITTLE SOUTH FORK OF RUBICON RIVER AT SAWMILL NEAR QUINTETTE, CAL.

LOCATION.—In the NW. ¼ NW. ¼ sec. 24, T. 13 N., R. 14 E., at South Fork sawmill, about half a mile above the mouth of Gerle Creek and 15 miles northeast of Quintette.

DRAINAGE AREA.—16.6 square miles.

RECORDS AVAILABLE.—February 1, 1910, to July 4, 1914, when station was discontinued.

GAGE.—Staff.

DISCHARGE MEASUREMENTS.—Made from cable.

CHANNEL AND CONTROL.—Compact gravel.

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MES OF DISCHARGE.—1910–1914: Maximum mean daily discharge, 509 second-t May 23, 1911; no flow July 31 to September 13 and October 20 to 31, 1910, l August 27 to 31, 1912.

R FLOW.—Stage-discharge relation affected by ice.

ACY.—Results excellent except for winter months.

ATION.—Record of daily discharge furnished by Truckee River General ctric Co., through L. O. Murphy, engineer.

ischarge, in second-feet, of Little South Fork of Rubicon River at sawmill near Quintette, Cal., for the year ending Sept. 30, 1914.

)ay.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
.....	1.0	2	7	280	42	56	56	165	186	45
.....	1.0	2	8	171	37	56	56	228	175	50
.....	1.0	2	7	94	35	52	88	280	144	56
.....	1.0	3	8	58	32	56	207	290	133	50
.....	1.0	3	7	46	31	64	312	280	97	.....
.....	.9	5	10	39	29	74	260	270	62	.....
.....	.9	7	7	41	27	81	217	290	74	.....
.....	1.0	7	10	46	28	97	175	302	74	.....
.....	1.0	5	10	32	27	105	417	270	74	.....
.....	1.0	5	10	28	27	105	186	175	105	.....
.....	1.0	5	10	26	27	105	217	207	114	.....
.....	1.0	5	10	25	27	123	165	217	123	.....
.....	1.0	5	8	41	27	123	196	207	97	.....
.....	1.0	5	7	50	27	123	249	228	105	.....
.....	1.0	5	10	37	28	123	375	270	105	.....
.....	1.0	5	8	32	28	175	249	217	97	.....
.....	1.0	5	7	32	28	186	175	196	97	.....
.....	1.0	5	8	29	32	207	228	217	81	.....
.....	1.0	5	10	28	39	207	291	207	74	.....
.....	1.0	5	10	26	75	186	249	217	62	.....
.....	1.0	5	10	27	140	186	165	249	56	.....
.....	1.0	5	10	123	114	186	123	207	123	.....
.....	1.0	5	10	88	82	186	88	217	74	.....
.....	1.0	5	10	101	53	144	81	196	50	.....
.....	1.0	5	10	214	60	123	81	228	50	.....
.....	1.0	5	10	153	63	105	81	165	50	.....
.....	1.0	7	15	101	52	88	88	186	50	.....
.....	1.0	7	19	75	40	74	88	175	50	.....
.....	1.0	7	22	58	.....	62	81	207	50	.....
.....	1.0	7	270	51	.....	56	114	207	50	.....
.....	2.0	.....	732	46	.....	50	.....	218	.....	.....

–Discharge for January estimated by the company as 6 per cent of that of Rubicon River near ; stage-discharge relation affected by ice.

y discharge of Little South Fork of Rubicon River at sawmill near Quintette, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 16.6 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
.....	2	0.9	1.03	0.062	0.07	63
r.....	7	2	5.0	.301	.34	298
r.....	732	7	41.6	2.51	2.89	2,560
.....	.....	.....	a70.9	4.27	4.92	4,360
.....	140	27	44.9	2.70	2.81	2,490
.....	207	50	115	6.93	7.99	7,070
.....	417	56	179	10.8	12.05	10,700
.....	302	165	225	13.6	15.68	13,800
.....	186	50	89.4	5.39	6.01	5,320
.....	56	45	50.2	3.02	.45	398
) period.....	.....	.....	.....	.....	.....	47,100

a See footnote to daily discharge table.

-*Monthly discharge computed* by engineers of U. S. Geological Survey.

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LITTLE SOUTH FORK OF RUBICON RIVER BELOW GERLE CREEK, NEAR QUINTETTE, CAL.

LOCATION.—In the SE. ¼ SE. ¼ sec. 21, T. 13 N., R. 14 E., one-fourth mile below Gerle Creek, 1 mile below South Fork sawmill, and 15 miles northeast of Quintette.

DRAINAGE AREA.—49.6 square miles.

RECORDS AVAILABLE.—February 1, 1910, to June 21, 1914, when station was discontinued.

GAGE.—Staff.

DISCHARGE MEASUREMENTS.—Made from cable.

CHANNEL AND CONTROL.—Gravel and boulders; practically permanent.

EXTREMES OF DISCHARGE.—1910–1914: Maximum mean daily discharge, 1,360 second-feet January 30, 1911; minimum mean daily discharge, 2 second-feet October 30 to November 7, 1910.

DIVERSIONS.—Water diverted from Gerle Creek, about 1¾ miles above the mouth, is discharged into Pilot Creek above Uncle Tom's Cabin.

REGULATION.—Flow from Loon Lake, at the head of Gerle Creek, is regulated by gates at its outlet.

WINTER FLOW.—Stage-discharge relation affected by ice.

ACCURACY.—Results excellent except for winter months.

COOPERATION.—Record of daily discharge furnished by Truckee River General Electric Co., through L. O. Murphy, engineer.

Daily discharge, in second-feet, of Little South Fork of Rubicon River below Gerle Creek, near Quintette, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	4.5	3	6	695	104	162	196	540	540
2	4.5	3	7	428	92	162	205	650	505
3	4.5	3	7	234	88	148	350	775	440
4	4.5	3	7	145	80	155	540	820	410
5	4.2	2	8	114	76	196	752	800	325
6	4.1	2	7	97	71	250	650	775	275
7	4.0	3	7	103	68	300	560	820	319
8	4.0	3	7	114	69	335	470	870	300
9	4.1	3	6	79	67	340	505	730	275
10	4.1	3	6	69	68	340	970	630	275
11	4.1	3	7	65	67	350	525	650	275
12	4.1	3	a22	61	68	395	455	690	196
13	4.1	3	6	103	67	395	505	690	187
14	4.1	4	6	124	68	390	590	690	187
15	4.1	5	8	91	69	390	845	730	187
16	4.0	5	13	79	69	525	610	650	187
17	4.0	5	19	79	69	610	470	610	187
18	4.0	5	27	73	80	610	575	610	170
19	4.0	6	31	69	98	610	710	590	178
20	4.0	6	45	65	275	555	610	595	134
21	4.0	6	45	67	350	520	470	630	90
22	4.0	6	55	308	225	540	380	575	.....
23	3.9	6	50	218	187	540	325	610	.....
24	3.5	6	40	252	162	440	300	610	.....
25	3.3	6	36	532	155	390	325	730	.....
26	3.0	7	33	382	155	350	335	540	.....
27	3.0	7	31	252	141	300	340	540	.....
28	3.0	6	27	186	148	250	335	540	.....
29	3.0	5	27	145	.....	225	325	560	.....
30	3.0	6	72	127	.....	205	410	575	.....
31	4.0	.....	1,450	114	.....	196	.....	590	.....

a Loon Lake gates raised.

NOTE.—Discharge Jan. 1 to Feb. 19 estimated by the company by comparison with record of Rubicon River near Quintette; channel obstructed by ice during this period. At Loon Lake there was 12 feet of snow Dec. 12 and from 2 to 3 feet Dec. 28.

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Monthly discharge of Little South Fork of Rubicon River below Gerle Creek, near Quintette, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 49.6 square miles.]

Month.	Discharge in second-feet.				Run-off.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.
October	4.5	3	3.89	0.078	0.09	239
November	7	2	4.5	.091	.10	268
December	1,450	6	68.3	1.38	1.59	4,200
January	.....	.....	a176	3.55	4.09	10,800
February	350	.....	a116	2.34	2.44	6,440
March	610	148	360	7.26	8.37	22,100
April	970	196	488	9.84	10.98	29,000
May	870	540	659	13.3	15.33	40,500
June 1–21	540	90	268	5.40	4.22	11,200
The period	.....	.....	.....	.....	.....	125,000

a See footnote to table of daily discharge.

NOTE.—Monthly discharge computed by engineers of U. S. Geological Survey.

GERLE CREEK NEAR RUBICON SPRINGS, CAL.

LOCATION.—In the SE. ¼ NE. ¼ sec. 5, T. 13 N., R. 15 E., at outlet of Loon Lake, 3¾ miles southwest of Rubicon Springs.

DRAINAGE AREA.—9 square miles.

RECORDS AVAILABLE.—July 12, 1910, to April 2, 1914, when station was discontinued (record incomplete).

GAGE.—Staff.

DISCHARGE MEASUREMENTS.—Made from cable.

CHANNEL.—Solid granite.

EXTREMES OF DISCHARGE.—1910–1914: Maximum mean daily discharge, 151 second-feet May 25, 1911; minimum mean daily discharge, 1 second-foot November 3, 1910, July 5 and 6, 1912. Note that the last two years of record are fragmentary.

WINTER FLOW.—Stage-discharge relation affected by ice.

REGULATION.—Discharge from Loon Lake regulated by gates at outlet.

COOPERATION.—Record of daily discharge furnished by Truckee River General Electric Co., through L. O. Murphy, engineer.

Daily discharge, in second-feet, of Gerle Creek near Rubicon Springs, Cal., for the period July 1, 1913, to Apr. 2, 1914.

Day.	July.	Aug.	Sept.	Oct.	Feb.	Apr.	Day.	July.	Aug.	Sept.	Oct.	Feb.	Apr.
1	4	.....	.....	.....	59	.....	16	30	.....	.....	.....	.....	.....
2	.....	.....	.....	.....	.....	59	17	.....	.....	30	.....	.....	.....
3	.....	.....	.....	.....	.....	.....	18	.....	.....	.....	.....	.....	.....
4	.....	.....	.....	.....	.....	.....	19	.....	.....	.....	10	.....	.....
5	.....	33	.....	.....	.....	.....	20	.....	.....	.....	.....	.....	.....
6	.....	.....	.....	.....	.....	.....	21	33	.....	.....	.....	.....	.....
7	.....	.....	.....	.....	.....	.....	22	.....	.....	.....	.....	.....	.....
8	.....	.....	30	.....	.....	.....	23	.....	30	.....	.....	.....	.....
9	.....	.....	.....	.....	.....	.....	24	.....	.....	.....	.....	.....	.....
10	10	.....	.....	.....	.....	.....	25	.....	.....	.....	.....	.....	.....
11	23	.....	.....	.....	.....	.....	26	.....	.....	27	10	.....	.....
12	.....	.....	.....	.....	.....	.....	27	37	.....	.....	10	.....	.....
13	.....	.....	.....	.....	.....	.....	28	30	30	27	.....	.....	.....
14	.....	.....	.....	23	30	.....	29	.....	.....	.....	.....	.....	.....
15	23	.....	.....	0	.....	.....	30	.....	.....	.....	.....	.....	.....
							31	.....	.....	.....	.....	.....	.....

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LITTLE SOUTH FORK DITCH AT SAWMILL NEAR QUINTETTE, CAL.

LOCATION.—At flume across Little South Fork of Rubicon River, about half a mile above sawmill and 15 miles northeast of Quintette.

RECORDS AVAILABLE.—June 7, 1910, to November 30, 1913, when station was discontinued.

GAGE.—Staff.

DISCHARGE MEASUREMENTS.—No information received.

COOPERATION.—Record of daily discharge furnished by Truckee River General Electric Co., through L. O. Murphy, engineer.

The intake of this canal is on Gerle Creek, about 1¼ miles above the mouth; the ditch extends southward until it crosses the Little Rubicon, then passes down the valley to a point in the main Rubicon canyon, where it is carried by a tunnel into the Pilot Creek drainage basin, a total distance of about 10 miles.

The South Fork ditch is used from June to November for conveying the stored water from Loon Lake to Pilot Creek, where the water is diverted into a ditch and used for irrigation on Georgetown divide. The ditch serves as a reservoir supply to Pilot Creek and is used only when the water of Pilot Creek is not sufficient to supply the demand.

Daily discharge, in second-feet, of Little South Fork ditch at sawmill near Quintette, Cal. for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Day.	Oct.	Nov.	Day.	Oct.	Nov.
1	15.7	4.0	11	15.7	.....	21	4.0	.....
2	15.7	4.0	12	15.7	.....	22	4.0	.....
3	15.7	4.0	13	15.7	.....	23	4.0	.....
4	15.7	4.0	14	15.7	.....	24	4.0	.....
5	15.7	4.0	15	15.7	.....	25	4.0	.....
6	15.7	4.0	16	4.0	.....	26	4.0	.....
7	15.7	4.0	17	4.0	.....	27	4.0	.....
8	15.7	4.0	18	4.0	.....	28	4.0	.....
9	15.7	4.0	19	4.0	.....	29	4.0	.....
10	15.7	4.0	20	4.0	.....	30	4.0	.....
						31	4.0	.....

Monthly discharge of Little South Fork ditch at sawmill near Quintette, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	15.7	4.0	9.66	594
November	4.0	.0	1.33	79
The period	.....	.....	.....	673

NOTE.—Monthly discharge computed by engineers of U. S. Geological Survey.

PILOT CREEK NEAR QUINTETTE, CAL.

LOCATION.—In the NW. ¼ NW. ¼ sec. 10, T. 12 N., R. 12 E., at Bacchi road crossing, about three-fourths mile southwest of Bacchi, and 4 miles east of Quintette.

DRAINAGE AREA.—18.7 square miles; natural run-off from the basin is increased by water diverted from Gerle Creek.

RECORDS AVAILABLE.—February 24, 1910, to July 30, 1914, when station was discontinued.

GAGE.—Staff.

DISCHARGE MEASUREMENTS.—Made from cable.

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EL AND CONTROL.—Compact gravel.

IES OF DISCHARGE.—1910–1914: Maximum mean daily discharge, 900 second-t January 25, 1914; minimum mean daily discharge, 4 second-feet, September December, 1910, January and September, 1911, and October and November, 3.

IONS.—Pilot Creek ditch diverts above the station.

ATION.—See Little South Fork ditch at sawmill near Quintette (p. 268).

CY.—Results excellent.

ATION.—Record of daily discharge furnished by Truckee River General ctric Co., through L. O. Murphy, engineer.

scharge, in second-feet, of Pilot Creek near Quintette, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	May.	June.	July.
.....	6	4	6	512	118	127	.....	24	8
.....	6	5	6	374	118	127	66	.....	8
.....	5.5	4	6	296	110	127	66	.....	8
.....	5.5	5	8	225	95	118	65	.....	8
.....	5.5	4	6	183	95	115	65	.....	8
.....	5	7	6	155	119	113	64	.....	8
.....	5	6	6	145	110	112	65	.....	8
.....	5	6	6	136	95	115	66	.....	8
.....	5	6	6	118	82	110	66	.....	8
.....	5	6	6	102	70	110	62	.....	8
.....	4	8	6	76	58	110	58	.....	8
.....	4	9	6	82	58	110	55	.....	8
.....	4	7	6	164	58	110	55	.....	8
.....	4	7	6	225	58	110	55	.....	7
.....	4	6	6	225	58	110	52	.....	8
.....	4	6	6	214	58	110	47	.....	8
.....	4	6	6	214	58	110	45	.....	8
.....	4	6	6	203	64	.....	42	.....	8
.....	4	6	6	183	100	.....	41	.....	7
.....	4	6	6	155	272	.....	40	.....	8
.....	4	6	6	118	405	.....	37	.....	8
.....	4	6	14	374	308	.....	31	.....	8
.....	4	5	14	456	248	.....	31	.....	8
.....	4	6	18	640	214	.....	31	.....	7
.....	4	6	42	900	193	.....	40	.....	8
.....	4	6	33	710	174	.....	39	.....	8
.....	4	6	23	374	160	.....	37	.....	8
.....	4	6	18	225	136	.....	37	.....	8
.....	4	6	16	174	.....	.....	31	8	8
.....	5	6	82	174	.....	.....	29	8	8
.....	5	.....	595	136	.....	.....	26	.....	.....

' discharge of Pilot Creek near Quintette, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 18.7 square miles.]

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
.....	6	4	4.50	277
r.....	9	4	6.0	357
.....	595	6	31.7	1,950
.....	900	76	267	16,400
.....	405	58	132	7,330
.7.....	127	110	114	3,840
.....	66	26	48.1	2,860
.....	8	7	7.9	470

Monthly discharge computed by engineers of U. S. Geological Survey.

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PILOT CREEK DITCH NEAR QUINTETTE, CAL.

LOCATION.—Just south of gaging station on Pilot Creek.

RECORDS AVAILABLE.—February 25, 1910, to January 31, 1914, when station was discontinued.

COOPERATION.—Record of daily discharge furnished by Truckee River General Electric Co., through L. O. Murphy, engineer.

The ditch diverts water from Pilot Creek above the gaging station on the creek.

Daily discharge, in second-feet, of Pilot Creek ditch near Quintette, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Day.	Oct.	Nov.	Dec.	Jan.
1	.....	9.6	10.2	15.1	16	.....	9.2	8.3	4.2
2	.....	10.8	10.2	15.1	17	.....	9.2	8.3	4.2
3	.....	9.6	9.2	15.1	18	.....	9.2	8.3	4.2
4	.....	9.6	9.2	15.1	19	.....	9.2	8.3	4.2
5	.....	9.2	9.2	15.1	20	.....	9.2	8.3	4.2
6	.....	9.2	9.2	15.1	21	.....	9.2	8.3	6.6
7	.....	9.2	8.3	15.1	22	.....	11.2	15.1	6.6
8	.....	9.2	8.3	15.1	23	.....	11.2	15.1	6.6
9	.....	9.2	8.3	15.1	24	.....	13.2	15.1	6.6
10	.....	9.2	8.3	15.1	25	5.8	13.2	15.1	6.6
11	.....	9.2	8.3	4.2	26	.....	13.2	15.1	6.6
12	.....	9.2	8.3	4.2	27	.....	13.2	15.1	6.6
13	.....	9.2	8.3	4.2	28	5.8	11.2	15.1	6.6
14	.....	9.2	8.3	4.2	29	.....	11.2	15.1	6.6
15	.....	9.2	8.3	4.2	30	.....	11.2	15.1	6.6
					31	.....	.....	15.1	4.2

NOTE.—Discharge estimated by the company Dec. 9–14, 16, 18–21, 23–29, and 31, Jan. 1–3, 5–10, 12–20, and 22–30.

Monthly discharge of Pilot Creek ditch near Quintette, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).
	Maximum.	Minimum.	Mean.	
October	.....	.....	[a]11.4	701
November	13.2	9.2	10.2	607
December	15.1	8.3	10.7	658
January	15.1	4.2	[a]18.5	523
The period	.....	.....	.....	2,490

[a] Estimated by the company.

NOTE.—Monthly discharge computed by engineers of U. S. Geological Survey.

SOUTH FORK OF AMERICAN RIVER NEAR PLACERVILLE, CAL.

LOCATION.—In the SE. ¼ sec. 26, T. 11 N., R. 10 E., 1,000 feet below bridge at Chilli Bar, on Placerville-Georgetown road, about 1,000 feet below Big Canyon Creek and 3 miles northwest of Placerville.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 11, 1911, to September 30, 1914.

GAGE.—Staff in two sections bolted to solid rock on right bank; high-water section is painted on the rocks above second section. Observer, M. M. Riggs.

DISCHARGE MEASUREMENTS.—Made from downstream side of bridge or by wading.

CHANNEL AND CONTROL.—Boulders and gravel; apparently permanent.

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EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 19.0 feet at 4 p. m. January 25 (approximate discharge, computed from extension of rating curve, 15,000 second-feet); minimum stage recorded, 3.30 feet October 1 (discharge, 59 second-feet).

1911–1914: Maximum stage recorded, 19.0 feet at 4 p. m. January 25, 1914 (approximate discharge, computed from extension of rating curve, 15,000 second-feet); minimum stage recorded, 3.28 feet September 25, 1913 (discharge, 57 second-feet).

DIVERSIONS.—Just below the mouth of Silver Fork water is diverted for irrigation, mining, and municipal supply for Placerville. Power is developed near the mouth of Rock Creek by the Western States Gas & Electric Co. Echo and Silver lakes are used as storage reservoirs.

ACCURACY.—Rating curve well defined; results excellent.

Discharge measurements of South Fork of American River near Placerville, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Oct. 5	Lasley Lee	3.72	104	Sept. 2	Charles Leidl	3.69	98
Feb. 23	Charles Leidl	9.82	3,880				

Daily discharge, in second-feet, of South Fork of American River near Placerville, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	59	76	162	7,740	2,280	2,040	1,820	2,370	5,760	2,120	356	95
2	68	89	144	4,880	2,040	2,040	1,740	3,080	5,430	2,040	322	95
3	95	95	128	3,450	1,820	1,960	1,890	4,040	5,100	2,040	306	89
4	78	89	114	2,040	1,680	1,890	2,200	4,660	4,440	1,890	290	95
5	101	101	101	1,600	1,600	1,890	4,240	4,880	3,740	1,340	290	89
6	78	101	101	1,280	1,540	2,040	3,740	4,880	2,720	1,600	275	89
7	89	114	114	1,160	1,480	2,120	3,360	5,100	2,370	1,540	260	95
8	75	121	121	1,600	1,410	2,200	3,260	5,650	2,280	1,480	246	101
9	76	114	114	1,220	1,340	2,370	2,900	5,540	2,200	1,340	232	101
0	78	101	108	1,100	1,280	2,460	6,780	4,140	2,370	1,280	206	95
1	78	101	144	1,040	1,220	2,460	4,340	4,140	2,900	1,160	206	89
2	78	275	121	980	1,220	2,540	3,540	4,770	3,180	1,100	194	84
3	76	206	144	2,370	1,220	2,640	3,360	4,880	3,260	980	194	78
4	76	172	206	4,040	1,160	2,540	4,240	4,240	3,260	980	219	78
5	73	153	153	2,720	1,160	2,540	4,660	5,320	3,260	875	206	78
6	76	144	136	1,960	1,100	2,720	5,320	5,320	3,840	875	172	78
7	78	128	114	1,890	1,220	3,080	3,940	4,660	3,840	875	162	78
8	78	121	114	4,040	1,340	3,260	4,040	5,210	3,640	875	153	89
9	84	183	136	1,960	2,540	3,360	5,100	4,990	3,540	775	153	95
0	89	162	128	1,680	3,540	3,260	5,320	4,880	3,840	875	144	101
1	89	232	128	1,410	7,980	3,260	3,840	4,880	3,450	775	144	101
2	89	162	260	10,600	5,100	3,260	3,260	5,650	3,000	730	128	89
3	89	144	472	5,540	3,840	3,360	2,900	4,440	2,720	640	121	89
4	89	128	246	7,500	3,080	3,080	2,640	4,440	2,460	596	114	84
5	89	128	875	10,500	2,720	2,820	2,460	4,040	2,900	575	114	78
6	89	162	685	9,590	2,370	2,640	2,460	3,840	2,370	554	101	101
7	89	183	356	6,200	2,200	2,370	2,370	3,940	2,200	554	101	89
8	89	322	290	4,240	2,040	2,200	2,370	4,550	2,200	492	95	84
9	89	219	246	3,260	.....	2,040	2,200	4,660	2,280	472	95	78
0	78	232	290	2,900	.....	1,890	2,120	5,320	2,200	432	89	78
1	73	.....	4,550	2,540	.....	1,820	.....	5,650	.....	393	89	.....

NOTE.—Discharge determined from a well-defined rating curve.

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Monthly discharge of South Fork of American River near Placerville, Cal., for year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	101	59	81.8	5,030	A.
November	322	76	152	9,040	A.
December	4,550	101	355	21,800	A.
January	10,600	980	3,650	224,000	A.
February	7,980	1,100	2,200	122,000	A.
March	3,360	1,820	2,520	155,000	A.
April	6,780	1,740	3,410	203,000	A.
May	5,650	2,370	4,650	286,000	A.
June	5,760	2,200	3,220	192,000	A.
July	2,120	393	1,040	64,000	A.
August	356	89	186	11,400	A.
September	101	78	88.8	5,280	A.
The year	10,600	59	1,790	1,300,000	

CLEAR LAKE AT LAKEPORT, CAL.

LOCATION.—At municipal wharf on north side of Third Street at Lakeport.

RECORDS AVAILABLE.—January 1, 1913, to September 30, 1914.

GAGE.—Vertical staff fastened to piling at municipal wharf.

EXTREMES OF STAGES.—1913–1914: Maximum stage recorded, 11.12 feet January 28, 1914; minimum stage recorded, 0.62 foot October 29, 1913.

COOPERATION.—Gage-height record furnished by Yolo Water & Power Co.

Daily gage height, in feet, of Clear Lake at Lakeport, Cal., for the year ending Sept. 30, 1914.

[A. M. Crump, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	0.98	0.68	0.97	4.60	10.80	10.42	8.35	7.35	6.20	5.20	4.18	3.34
2	.95	.70	1.00	5.15	10.70	10.31	8.30	7.35	6.23	5.16	4.16	3.33
3	.92	.70	1.00	5.50	10.60	10.28	8.30	7.30	6.20	5.13	4.12	3.30
4	.85	.70	1.02	5.65	10.50	10.22	8.30	7.30	6.18	5.12	4.10	3.25
5	.88	.70	1.02	5.83	10.38	10.10	8.30	7.25	6.10	5.11	4.09	3.23
6	.85	.71	1.00	5.90	10.27	9.93	8.28	7.18	6.00	5.10	4.05	3.06
7	.80	.72	1.00	6.00	10.15	9.83	8.22	7.15	6.00	5.03	4.00	3.00
8	.84	.72	1.00	6.03	10.05	9.77	8.22	7.12	5.95	4.93	3.99	3.02
9	.80	.72	1.03	6.08	9.95	9.68	8.18	7.08	5.98	4.88	3.95	3.01
10	.80	.73	1.01	6.10	9.85	9.57	8.20	7.04	5.95	4.84	3.92	3.00
11	.80	.73	1.03	6.15	9.75	9.50	8.15	7.00	5.91	4.83	3.88	2.97
12	.78	.72	1.11	6.30	9.70	9.37	8.15	6.99	5.81	4.79	3.84	2.97
13	.74	.73	1.12	6.50	9.60	9.30	8.00	6.95	5.80	4.78	3.81	2.95
14	.74	.72	1.12	7.15	9.45	9.25	8.10	6.92	5.79	4.76	3.80	2.93
15	.72	.73	1.12	7.45	9.35	9.19	8.00	6.90	5.78	4.73	3.78	2.91
16	.72	.72	1.11	7.70	9.25	9.08	7.98	6.85	5.75	4.71	3.75	2.88
17	.71	.72	1.11	8.00	9.25	9.00	7.95	6.78	5.71	4.68	3.71	2.86
18	.70	.87	1.11	8.60	9.25	8.93	7.95	6.75	5.68	4.60	3.66	2.84
19	.70	.88	1.11	8.70	9.32	8.85	7.90	6.72	5.65	4.57	3.63	2.84
20	.70	.85	1.12	8.85	9.50	8.80	7.85	6.71	5.60	4.55	3.60	2.83
21	.70	.86	1.12	9.30	10.28	8.74	7.85	6.65	5.57	4.52	3.56	2.82
22	.69	.87	1.12	10.05	10.55	8.67	7.75	6.62	5.51	4.49	3.54	2.80
23	.69	.86	1.38	10.35	10.70	8.60	7.60	6.60	5.41	4.50	3.52	2.80
24	.68	.86	1.61	10.60	10.72	8.54	7.65	6.55	5.39	4.46	3.50	2.79
25	.68	.87	2.18	10.90	10.72	8.52	7.60	6.50	5.37	4.40	3.48	2.77
26	.66	.88	2.40	11.10	10.68	8.45	7.55	6.52	5.34	4.36	3.45	2.77
27	.65	1.00	2.50	11.10	10.59	8.40	7.55	6.50	5.32	4.33	3.42	2.75
28	.64	1.00	2.55	11.12	10.50	8.35	7.50	6.47	5.29	4.31	3.40	2.73
29	.63	.99	2.60	11.05	.....	8.32	7.45	6.45	5.27	4.29	3.39	2.70
30	.66	.97	2.85	11.00	.....	8.30	7.35	6.38	5.24	4.26	3.37	2.69
31	.....	.....	3.85	10.90	.....	8.35	.....	6.30	.....	4.20	3.37	.....

CACHE CREEK AT LOWER LAKE, CAL.

LOCATION.—In the SE. ¼ SE. ¼ sec. 34, T. 13 N., R. 7 W., above highway bridge near outlet of Clear Lake, about 750 feet above mouth of Seigler Creek, and 1 mile north of Lower Lake.

DRAINAGE AREA.—500 square miles.

RECORDS AVAILABLE.—January 1, 1901, to September 30, 1914.

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Vertical staff on left bank 800 feet above bridge. Observer, Miss L. T. erson.

GE MEASUREMENTS.—Made from bridge or by wading. Flow of Seigler Creek ducted when measurements are made from bridge.

, AND CONTROL.—Gravel and fairly permanent.

ES OF STAGES.—Maximum stage recorded during year, 11.1 feet January 27 harge, 3,960 second-feet); channel dry from November 18 to 29.

01–1914: Maximum stage recorded, 13.8 feet February 20, 1909 (discharge, second-feet); channel dry September 2 to 14 and 19 to 30, 1913, and Novem- 8 to 29, 1914.

Y.—At high stages Seigler Creek deposits gravel at its junction with Cache k, forming a small bar that sometimes affects the control. At low water the nel is sometimes deepened in order to increase the flow from the lake. ng the fall of 1913 all brush and trees on the right bank in the vicinity of age were removed. The station has been rerated and the results, beginning ary 1, 1914, are excellent.

measurements of Cache Creek at Lower Lake, Cal., during the year ending Sept. 30, 1914.

Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
	Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Lasley Lee	.....	a 0	Mar. 27	R. C. Rice	6.99	1,330
...do	10.80	3,730	June 4	Charles Leidl	5.00	579
...do	10.62	3,610	4	.....do	5.00	580
R. C. Rice	7.00	1,310				

ary dam under highway bridge prevented water from flowing downstream. Discharge from ek, 6.9 second-feet, was flowing upstream into Clear Lake.

charge, in second-feet, of Cache Creek at Lower Lake, Cal., for the year ending Sept. 30, 1914.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	5	2	3	345	3,580	3,500	1,180	830	580	395	235	137
.....	5	2.5	5	470	3,430	3,150	1,180	830	580	395	235	137
.....	5	1.5	5.5	495	3,360	3,080	1,140	830	580	370	235	137
.....	5	3	6	520	3,290	3,010	1,180	795	580	370	235	137
.....	5	2.5	6	520	3,150	3,010	1,140	795	580	370	226	137
.....	4	3	5.5	520	3,080	2,870	1,180	760	520	370	217	137
.....	5	3	5.5	580	3,010	2,800	1,140	760	520	370	217	137
.....	4	10	5.5	580	2,870	2,660	1,060	760	520	345	217	123
.....	3.5	3	5.5	580	2,800	2,540	1,100	760	520	345	208	123
.....	3.5	2.5	5	580	2,730	2,470	1,230	760	520	345	208	116
.....	3.5	2.5	5	550	2,660	2,400	1,140	730	520	320	200	116
.....	5	2.5	5	730	2,600	2,340	1,060	700	520	320	200	116
.....	3.5	2.5	10	640	2,470	2,280	1,020	700	495	320	200	110
.....	3.5	3	7	1,060	2,400	2,210	1,100	700	495	320	200	110
.....	3	3	6.5	900	2,340	2,150	1,140	700	495	320	200	110
.....	2.5	2	6	900	2,210	2,090	1,060	700	495	320	183	110
.....	3	2	7	1,280	2,210	1,910	1,060	700	470	320	183	110
.....	2.5	.....	7	1,470	2,280	1,850	1,060	700	470	295	183	110
.....	2.5	.....	7	1,630	2,280	1,800	1,020	670	470	295	183	110
.....	2.5	.....	6	1,850	2,800	1,740	980	670	470	295	175	104
.....	2.5	.....	6	2,340	3,080	1,680	940	640	470	285	175	97
.....	2.5	.....	14	3,080	3,500	1,630	980	640	470	285	167	97
.....	2.5	.....	18	3,150	3,500	1,520	900	610	445	275	167	95
.....	2	.....	520	3,500	3,580	1,470	900	610	445	275	167	95
.....	2	.....	86	3,880	3,660	1,420	900	610	445	275	159	91
.....	2	.....	105	3,880	3,500	1,420	900	610	445	265	159	97
.....	2	.....	105	3,960	3,360	1,320	900	640	445	255	159	85
.....	2	.....	132	3,880	3,290	1,230	900	610	420	255	151	85
.....	2	.....	132	3,800	.....	1,230	865	610	395	255	151	85
.....	2	2	245	3,730	.....	1,230	830	580	395	255	144	85
.....	1.5	.....	370	3,730	.....	1,230	.....	580	.....	255	144	.....

Discharge determined as follows: Oct. 1 to Nov. 17 and Dec. 2, 1913, to Jan. 27, 1914, from fairly l rating curve; Jan. 28 to Sept. 30, 1914, from well-defined curve; no flow Nov. 18–29; interpolated d Dec. 1, 1913. Temporary sand-bag dam under highway bridge opened Oct. 1; replaced by r & Power Co. Nov. 18; Nov. 30, small opening made in dam; Dec. 2, dam entirely removed. , 1913, Lasley Lee measured 6.9 second-feet discharge of Siegler Creek flowing upstream past ache Creek. No water passing dam at bridge.

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Monthly discharge of Cache Creek at Lower Lake, Cal., for the year ending Sept. 30, 1914.

[Drainage area, 500 square miles.]

Month.	Discharge in second-feet.				Run-off.		Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.	Total in acre-feet.	
October	5	1.5	3.21	0.0064	0.007	197	C.
November	10	0	1.75	.0035	.004	104	D.
December	520	3	59.7	.120	.14	3,670	C.
January	3,960	345	1,780	3.56	4.10	109,000	A.
February	3,660	2,210	2,960	5.92	6.16	164,000	A.
March	3,500	1,230	2,100	4.20	4.84	129,000	A.
April	1,180	830	1,040	2.08	2.32	61,900	A.
May	830	580	696	1.39	1.60	42,800	A.
June	580	395	492	.984	1.10	29,300	A.
July	395	255	314	.628	.72	19,300	A.
August	235	144	190	.380	.44	11,700	A.
September	137	85	111	.222	.25	6,600	A.
The year	3,960	0	800	1.60	21.68	578,000	

CACHE CREEK AT YOLO, CAL.

LOCATION.—At highway bridge one-half mile south of Yolo, in Río Jesús María grant, 1,000 feet above Southern Pacific Co.'s railroad bridge.

DRAINAGE AREA.—1,320 square miles.

RECORDS AVAILABLE.—January 1, 1903, to September 30, 1914.

GAGE.—Staff in four sections. Lowest section, vertical, is fastened to pile under bridge near left bank; second section, inclined, is on right bank, 30 feet above bridge; third section, vertical, is fastened to cottonwood tree on right bank, 70 feet above bridge; fourth section, vertical, is fastened to upper end of right abutment. This gage was installed October 2, 1904, at the same datum as the original gage at the bridge. Observer, Mrs. C. W. Bigelow.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Sand and gravel; somewhat shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 27.4 feet at 9.30 p. m. December 31 (approximate discharge, computed from extension of rating curve, 20,500 second-feet); channel dry October 1 to November 27.

1903–1914: Maximum stage recorded, 27.8 feet February 3, 1909 (discharge, 20,800 second-feet); channel dry for various periods.

DIVERSIONS.—Numerous ditches divert water for irrigation above the station.

ACCURACY.—Rating tables fairly well defined; results good.

Discharge measurements of Cache Creek at Yolo, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Dec. 27	Charles Leidl	3.82	1,400	Feb. 12	Charles Leidl	6.89	3,310
27	do	3.78	1,260	Mar. 29	R. C. Rice	4.88	1,730
Jan. 2	do	11.60	7,080	Apr. 26	Charles Leidl	3.87	1,190
2	do	13.55	8,640	June 6	do	2.30	410
3	do	10.25	6,300	27	do	1.57	138
17	R. C. Rice	17.20	12,300	Aug. 30	do	.97	11
Feb. 1	Charles Leidl	9.45	5,370				

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Daily discharge, in second-feet, of Cache Creek at Yolo, Cal., for the year ending Sept. 30, 1914.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	.....	138	15,700	5,440	4,840	1,780	1,010	467	162	54	22
2	.....	88	7,550	5,180	4,680	1,720	1,010	467	162	54	28
3	.....	69	6,200	4,930	4,420	1,650	958	446	162	48	36
4	.....	41	3,990	4,760	4,250	1,590	958	432	162	26	28
5	.....	26	2,820	4,590	4,080	1,980	958	418	178	16	16
6	.....	14	2,220	4,160	3,910	1,840	906	404	195	12	12
7	.....	7	1,950	3,910	3,740	1,720	906	446	195	8	6
8	.....	2	1,950	3,820	3,570	1,590	906	446	178	12	2
9	.....	0	1,630	3,740	3,480	1,590	906	425	178	16	2
10	.....	0	1,510	3,570	3,320	1,780	906	425	172	16	0
11	.....	0	1,390	3,480	3,230	1,720	856	404	146	16	0
12	.....	0	1,450	3,320	3,140	1,650	856	404	162	16	0
13	.....	0	6,880	3,230	2,980	1,530	806	384	146	16	0
14	.....	0	9,520	3,060	2,890	1,530	806	364	146	16	0
15	.....	0	10,900	2,890	2,800	1,470	806	344	146	16	0
16	.....	69	4,840	2,720	2,640	1,470	806	324	146	16	0
17	.....	36	9,680	2,560	2,560	1,410	806	256	146	12	0
18	.....	18	11,600	3,400	2,400	1,350	758	219	131	12	0
19	.....	12	6,540	5,360	2,320	1,350	664	195	116	8	0
20	.....	8	8,070	9,780	2,240	1,290	664	195	110	6	8
21	.....	8	18,700	18,500	2,180	1,290	641	178	83	4	12
22	.....	772	11,100	8,840	2,100	1,240	574	178	60	4	12
23	.....	1,080	9,690	8,840	2,040	1,240	574	162	28	2	16
24	.....	538	12,600	6,800	1,980	1,240	552	205	28	2	0
25	.....	12,500	11,400	6,200	1,910	1,180	552	162	22	1	0
26	.....	3,220	13,600	5,700	1,840	1,180	530	162	22	1	0
27	.....	1,330	10,500	5,360	1,780	1,120	509	162	22	14	0
28	605	854	7,820	5,100	1,720	1,120	488	162	31	16	0
29	193	735	6,880	.....	1,720	1,070	488	162	60	28	0
30	144	902	6,290	.....	1,910	1,010	488	162	44	16	0
31	.....	19,100	5,860	.....	1,720	.....	488	.....	44	12	.....

NOTE.—Discharge determined from 3 fairly well defined rating curves applicable Nov. 28 to Dec. 24, 1913; Dec. 25–30, 1913, and Jan. 3–20, 1914, and Jan. 21 to Sept. 30, 1914. Discharge June 4 and 5 interpolated. Channel dry Oct. 1 to Nov. 27.

Monthly discharge of Cache Creek at Yolo, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0	0	0.0	0	
November	605	0	31.4	1,870	B.
December	19,100	0	1,340	82,400	C.
January	18,700	1,390	7,450	458,000	B.
February	18,500	2,560	5,330	296,000	B.
March	4,840	1,720	2,850	175,000	B.
April	1,980	1,010	1,460	86,900	B.
May	1,010	488	746	45,900	B.
June	467	162	305	18,100	B.
July	195	22	116	7,130	A.
August	54	1	16.0	984	B.
September	36	0	6.7	400	C.
The year	19,100	0	1,620	1,170,000	

PUTAH CREEK AT WINTERS, CAL.

LOCATION.—Just below Southern Pacific Co.'s railroad bridge at Winters, in the Río de los Putos grant.

DRAINAGE AREA.—805 square miles.

RECORDS AVAILABLE.—September 26, 1905, to September 30, 1914.

GAGE.—Staff in five sections on left bank, 600 feet below bridge. An auxiliary vertical staff on right bank is used for low water. The original gage datum has been maintained. Observer, Miss Velma Wyatt.

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DISCHARGE MEASUREMENTS.—Made from cable at gage or by wading.

CHANNEL AND CONTROL.—Sand and gravel; somewhat shifting. Two channels at low water.

EXTREMES OF DISCHARGE.—1905–1914: Maximum stage recorded, 39.0 feet, December 31, 1913, from flood marks at gage (approximate discharge, computed from extension of rating curve, 60,000 second-feet); channel dry during part of the years ending September 30, 1913 and 1914.

DIVERSIONS.—Several small ditches divert water for irrigation above the station.

ACCURACY.—Changes in channel fairly well defined by measurements; results fair.

Discharge measurements of Putah Creek at Winters, Cal., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.		Discharge.	Date.	Made by—	Gage height.		Discharge.
		Left bank.	Right bank.				Left bank.	Right bank.	
		Feet.	*Feet.*	*Sec.-ft.*			*Feet.*	*Feet.*	*Sec.-ft.*
Dec. 26	Charles Leid.....	10.28	.....	3,740	Feb. 13	Charles Leidl.....	6.29	6.42	826
Jan. 1	.....do.....	18.12	.....	13,600	Mar. 15	.....do.....	5.93	6.20	587
1	.....do.....	16.08	.....	10,800	29	R. C. Rice.....	5.42	5.75	396
4	.....do.....	10.63	.....	4,120	Apr. 28	Charles Leidl.....	4.86	5.14	257
19	R. C. Rice.....	12.65	.....	7,410	June 6	.....do.....	4.20	4.58	76
19	.....do.....	12.72	.....	7,800	28	.....do.....	3.90	4.42	45
Feb. 2	Charles Leidl.....	7.84	7.86	2,000	Aug. 30	.....do.....	3.70	4.10	9

Daily discharge, in second-feet, of Putah Creek at Winters, Cal., for the year ending Sept. 30, 1914.

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	.....	245	16,100	2,140	1,870	720	222	98	41	9	9
2	.....	160	15,400	1,960	1,610	525	218	94	34	9	9
3	.....	130	6,050	1,780	1,450	480	214	90	34	9	9
4	.....	105	4,250	1,610	1,370	435	210	86	27	9	9
5	.....	83	2,350	1,530	1,220	1,010	206	82	27	9	9
6	.....	83	1,480	1,370	1,220	570	202	78	27	9	9
7	.....	63	1,480	1,220	1,030	495	198	78	27	9	9
8	.....	63	1,240	1,100	920	475	194	78	27	9	9
9	.....	54	790	990	888	455	190	78	27	9	9
10	.....	45	790	920	825	1,080	186	78	22	9	9
11	.....	54	480	855	768	680	182	78	22	9	9
12	.....	45	2,260	795	712	540	178	78	27	6	6
13	.....	83	7,250	768	685	470	174	78	22	6	6
14	.....	305	18,100	740	635	475	170	68	22	6	6
15	.....	245	8,500	712	610	410	166	68	22	6	6
16	.....	208	4,600	685	562	390	162	58	22	6	6
17	.....	145	11,100	660	540	355	158	58	22	9	6
18	.....	118	9,500	2,600	520	320	154	58	22	9	6
19	.....	105	7,280	5,090	450	325	150	50	22	9	6
20	.....	105	5,100	15,800	425	310	146	50	17	9	6
21	.....	105	7,500	15,600	400	295	142	50	17	9	6
22	.....	7,610	31,400	4,870	400	280	138	50	17	9	6
23	.....	2,450	7,210	6,080	400	265	134	41	13	9	6
24	.....	235	22,400	3,700	400	268	130	50	13	9	6
25	.....	18,600	12,800	3,300	400	270	126	50	13	9	6
26	.....	3,850	12,800	2,600	400	255	122	50	13	9	6
27	2,120	1,720	6,630	2,320	380	245	118	50	13	9	6
28	570	1,080	4,650	2,050	400	235	114	41	13	9	6
29	375	755	3,800	.....	400	230	110	41	9	9	6
30	455	1,640	3,100	.....	620	226	106	41	9	9	6
31	.....	40,000	2,500	.....	870	.....	102	.....	9	9	.....

NOTE.—Channel dry Oct. 1 to Nov. 26. Discharge Nov. 27 is mean of 24 hourly discharges; that for Dec. 31 estimated. Discharge Mar. 30 to June 5 computed by indirect method for shifting channels.

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Monthly discharge of Putah Creek at Winters, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	0	0	0.0	0	
November	2,120	0	117	6,960	C.
December	40,000	45	2,600	160,000	C.
January	31,400	480	7,710	474,000	C.
February	15,800	660	2,990	166,000	C.
March	1,870	380	754	46,400	C.
April	1,080	226	436	25,900	C.
May	222	102	162	9,960	C.
June	98	41	64.9	3,860	B.
July	41	9	21.0	1,290	B.
August	9	6	8.5	523	C.
September	9	6	7.1	422	C.
The year	40,000	0	1,240	895,000	

MATTOLE RIVER BASIN.

MATTOLE RIVER NEAR PETROLIA, CAL.

LOCATION.—In the SW. ¼ sec. 11, T. 2 S., R. 2 W., at highway bridge, about 2 miles southeast of Petrolia.

DRAINAGE AREA.—264 square miles.

RECORDS AVAILABLE.—November 21, 1911, to December 31, 1913, when station was discontinued.

GAGE.—Staff in four sections on left bank, 1,000 feet above bridge, installed May 15, 1913. Original gage was painted on the left pier of highway bridge; January 13, 1912, a chain gage was installed on the bridge at same datum as original gage; datum of present gage independent.

DISCHARGE MEASUREMENTS.—Made from bridge at gage or by wading.

CHANNEL AND CONTROL.—Sand and gravel; will shift during high water.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 21.0 feet at 6 p. m. December 31 (discharge unknown); minimum stage recorded, 6.20 feet October 27 to 31 (discharge, 20 second-feet).

1912–1914: maximum stage recorded, 27.1 feet at 5 p. m. January 25, 1912; discharge, computed from extension of rating curve, 62,700 second-feet); minimum stage recorded, 6.20 feet September 1, 2, and 16 to 30, and October 27 to 31, 1913 (discharge, 20 second-feet).

ACCURACY.—Rating curve fairly well defined below 1,000 second-feet.

COOPERATION.—Gage-height record furnished by Frank Adams.

No discharge measurements were made at this station during the year.

Daily gage height, in feet, of Mattole River near Petrolia, Cal., for the year ending Sept. 30, 1914.

[Frank Adams, observer.]

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	6.35	6.30	6.50	11	6.30	8.5	.....	21	6.28	6.84	.....
2	6.34	6.30	6.20	12	6.30	7.40	.....	22	6.28	6.79	.....
3	6.32	6.30	6.20	13	6.30	7.15	.....	23	6.25	6.72	.....
4	6.32	6.30	6.25	14	6.28	7.16	.....	24	6.25	6.66	9.9
5	6.31	6.30	6.44	15	6.28	7.11	.....	25	6.25	6.61	10.4
6	6.30	6.29	8.18	16	6.28	7.11	.....	26	6.25	7.05	9.9
7	6.30	6.32	7.10	17	6.28	7.01	.....	27	6.20	9.9	9.5
8	6.30	6.42	6.91	18	6.28	6.94	.....	28	6.20	8.9	8.9
9	6.30	6.40	.....	19	6.28	6.90	.....	29	6.20	8.2	9.75
10	6.30	6.42	.....	20	6.28	6.89	.....	30	6.20	7.40	11.15
								31	6.20	.....	18.0

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Daily discharge, in second-feet, of Mattole River near Petrolia, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Day.	Oct.	Nov.	Day.	Oct.	Nov.
1	60	45	11	45	2,070	21	40	272
2	57	45	12	45	660	22	40	245
3	51	45	13	45	465	23	32	210
4	51	45	14	40	472	24	32	180
5	48	45	15	40	437	25	32	155
6	45	42	16	40	437	26	32	398
7	45	51	17	40	372	27	20	.....
8	45	82	18	40	329	28	20	.....
9	45	75	19	40	305	29	20	.....
10	45	82	20	40	300	30	20	.....
						31	20	.....

NOTE.—Discharge determined from a fairly well defined rating curve.

Monthly discharge of Mattole River near Petrolia, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	60	20	39.2	2,410	B.
November 1–26	2,070	42	302	15,000	C.

EEL RIVER BASIN.

EEL RIVER AT TWO RIVERS, CAL.[1]

LOCATION.—In the SW. ¼ sec. 31, T. 22 N., R. 13 W., at highway bridge at Two Rivers [2] and about 500 feet below junction of South Eel and Middle Eel rivers. Burger Creek enters about 1 mile below the station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—November 15, 1911, to December 30, 1913.

GAGE.—Inclined staff in three sections on right bank at bridge.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Solid rock and coarse gravel; fairly permanent.

EXTREMES OF DISCHARGE.—1912–1914: Maximum stage recorded, 35.0 feet at 9 a. m. January 18, 1913 (discharge, 67,500 second feet); minimum stage recorded, 7.3 feet throughout September and October, 1913 (discharge, 19 second feet).

DIVERSIONS.—The Snow Mountain Water & Power Co. diverts water from the South Eel above Hearst to East Fork of Russian River for use in power development at Potter Valley.

ACCURACY.—Rating curve well defined below 12,000 second feet; estimates above this stage somewhat approximate.

COOPERATION.—Gage height record furnished by H. H. Beard.

[1] Station originally described as near Laytonville.

[2] Northwestern Pacific Railroad station is Dos Rios.

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Discharge measurements of Eel River at Two Rivers, Cal., during the year ending Sept. 30, 1914.

[Made by Lasley Lee.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
	Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*
Dec. 3	9.41	440	Dec. 10	8.65	221

Daily discharge, in second feet, of Eel River at Two Rivers, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	19	44	.....	11	.....	.....	338	21	.....	.....	.....
2	.....	44	.....	12	.....	.....	.....	22	.....	.....	9,660
3	.....	34	440	13	.....	44	3,000	23	19	.....	.....
4	.....	56	805	14	19	.....	.....	24	.....	.....	14,200
5	.....	70	.....	15	.....	.....	.....	25	.....	.....	38,400
6	19	70	.....	16	.....	.....	805	26	.....	705	.....
7	.....	.....	.....	17	.....	.....	655	27	.....	11,000	.....
8	.....	.....	.....	18	.....	308	565	28	.....	.....	2,380
9	.....	.....	230	19	.....	520	478	29	.....	.....	2,020
10	.....	56	219	20	.....	.....	565	30	.....	3,450	35,100
								31	19	.....	.....

EEL RIVER AT SCOTIA, CAL.

LOCATION.—In sec. 18, T. 1 N., R. 1 E., at suspension bridge, about one half mile northeast of Scotia. Laribee Creek enters about 14 miles above and Van Duzen River 7 miles below the station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—December 15, 1910, to September 30, 1914.

GAGE.—Staff in five sections on left bank at bridge. Observer, A. Scatena.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Solid rock and gravel; fairly permanent.

EXTREMES OF DISCHARGE.—1911–1914: Maximum stage recorded, 52.5 feet at 8 a. m., January 22, 1914 (discharge, computed from extension of rating curve, 260,000 second-feet); minimum stage recorded, 9.42 feet October 5 and 6, 1913 (discharge, 102 second-feet; September 16, 1914, gage reading was 9.1, the discharge being 160 second-feet).

ACCURACY.—Rating curves fairly well defined; results good except for extreme flood stages.

No discharge measurements were made during the year.

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Daily discharge, in second-feet, of Eel River at Scotia, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	103	124	4,930	165,000	15,600	22,100	9,650	8,950	2,920	550	310	168
2	103	131	3,660	113,000	15,200	20,800	9,650	8,950	2,710	520	290	168
3	102	153	2,750	93,600	14,400	17,600	8,600	8,950	2,510	490	290	168
4	102	164	2,150	69,200	12,800	15,600	12,000	8,600	2,420	430	275	168
5	102	240	1,550	32,600	11,600	12,800	29,600	8,600	2,320	380	260	168
6	102	628	1,400	25,700	10,800	11,600	16,400	8,300	2,060	.....	260	168
7	117	1,630	1,400	21,200	8,950	11,200	13,600	8,300	1,680	.....	245	168
8	116	1,320	1,250	28,100	8,000	10,400	11,600	8,300	1,540	.....	230	168
9	115	990	990	21,200	7,700	10,400	15,200	8,000	1,480	.....	220	160
10	114	875	820	19,800	7,700	10,000	24,800	8,000	1,480	.....	210	160
11	113	875	1,320	17,600	7,700	9,650	20,300	8,000	1,410	.....	210	160
12	113	820	2,240	23,000	7,100	9,650	16,800	7,700	1,350	.....	210	160
13	112	628	7,630	34,100	5,900	9,300	14,400	7,700	1,290	.....	200	160
14	112	506	7,960	59,000	5,340	8,950	13,600	7,700	1,230	.....	200	160
15	112	426	6,360	77,400	5,340	8,600	16,800	7,400	1,170	.....	200	160
16	111	385	4,930	45,900	5,070	8,300	15,200	7,400	1,120	.....	190	160
17	111	306	3,190	54,800	4,810	8,300	12,400	7,400	1,010	.....	190	.....
18	111	674	2,970	45,900	7,700	8,000	11,600	7,100	960	.....	190	.....
19	110	820	2,750	50,300	20,300	7,700	11,200	7,100	910	.....	182	.....
20	110	1,720	2,750	100,000	30,600	7,700	10,800	7,100	860	.....	182	.....
21	110	1,470	4,660	168,000	125,000	7,400	10,800	6,800	860	.....	182	.....
22	110	1,320	20,300	231,000	87,100	7,100	10,400	6,500	815	.....	175	.....
23	110	1,180	23,900	137,000	69,200	7,100	10,400	6,500	815	.....	175	.....
24	110	990	28,600	96,800	33,600	6,500	10,000	5,340	770	.....	175	.....
25	110	820	94,900	92,300	29,100	5,900	10,000	4,810	770	.....	175	310
26	110	1,800	47,600	92,300	26,600	5,340	9,650	6,500	770	.....	175	310
27	109	7,630	28,600	62,000	24,800	5,070	9,650	7,400	730	.....	175	310
28	109	12,000	25,200	42,100	23,900	5,070	9,300	5,070	730	.....	175	290
29	109	6,670	16,800	29,600	.....	7,700	9,300	4,810	655	.....	168	290
30	109	8,300	28,600	24,400	.....	10,400	8,950	4,300	585	.....	168	290
31	109	.....	179,000	19,400	.....	10,400	.....	3,580	.....	.....	168	.....

NOTE.—Discharge determined from two fairly well defined rating curves applicable Oct. 1 to Jan. 22 and Jan. 23 to Sept. 30. Mean discharge for July 2–31, 1914, estimated by comparison with records for Middle Eel River near Covelo, Cal., as 340 second-feet, and for Sept. 17–24, 1914, as 235 second-feet.

Monthly discharge of Eel River at Scotia, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	117	102	110	6,760	B.
November	12,000	124	1,850	110,000	B.
December	179,000	820	18,100	1,110,000	C.
January	231,000	17,600	67,500	4,150,000	C.
February	125,000	4,810	22,600	1,260,000	B.
March	22,100	5,070	9,890	608,000	B.
April	29,600	8,600	13,100	780,000	B.
May	8,950	3,580	7,130	438,000	B.
June	2,920	585	1,330	79,100	B.
July	550	.....	362	22,300	D.
August	310	168	208	12,800	C.
September	310	160	210	12,500	C.
The year	231,000	102	11,900	8,590,000	

MIDDLE EEL RIVER NEAR COVELO, CAL.

LOCATION.—In the E. ½ sec. 36, T. 23 N., R. 12 W., near Covelo ranger station, in California National Forest, about 6 miles east of Covelo. Williams Creek enters about half a mile above the station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 22, 1911, to September 30, 1914.

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—Staff in four sections on left bank, about one-fourth mile west of ranger station and 1 mile below bridge. Observer, C. V. Brereton.

ARGE MEASUREMENTS.—Made from cable installed December 8, 1913, 300 feet ove gage.

EL AND CONTROL.—Small boulders and gravel; fairly permanent.

MES OF DISCHARGE.—1911–1914: Maximum stage recorded, between 30 and 31 t at 4.30 p. m. December 31, 1913 (discharge, between 41,500 and 47,100 second-t; water over top of gage and high-water section washed out); minimum stage orded, 7.15 feet September 24 to 28 and October 1 to 5, 1913 (discharge, 10 ond-feet).

ACY.—Rating curve well defined except for extremely high stages; results good cept during flood periods.

RATION.—Station maintained in cooperation with United States Forest Service.

ge measurements of Middle Eel River near Covelo, Cal., during the year ending Sept. 30, 1914.

Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
	Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
C. V. Brereton	8.72	150	Apr. 5	C. V. Brereton	14.65	5,970
Lasley Lee	8.67	129	May 28	do	10.50	913
C. V. Brereton	14.27	5,160				

ischarge, in second-feet, of Middle Eel River near Covelo, Cal., for the year ending Sept. 30, 1914.

y.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	10	18	276	13,400	2,210	4,100	1,310	1,090	955	186	32	14
.....	10	27	214	24,100	2,110	3,390	2,010	1,240	890	186	32	14
.....	10	32	186	8,870	1,820	2,880	4,870	1,390	826	162	30	16
.....	10	41	174	7,250	1,730	2,530	9,230	1,730	646	162	30	14
.....	10	51	162	5,030	1,560	2,530	6,190	1,640	590	162	30	14
.....	11	390	151	3,670	1,470	3,390	3,130	1,560	646	151	27	14
.....	11	140	151	6,890	1,470	3,670	2,880	1,470	590	140	27	14
.....	11	78	140	4,100	1,390	3,810	3,390	1,470	536	140	27	14
.....	11	51	130	3,260	1,310	3,810	11,100	1,390	510	140	27	16
.....	12	48	130	2,210	1,310	3,950	10,700	1,390	510	104	27	16
.....	12	41	826	2,010	1,310	3,950	10,500	1,240	484	104	24	14
.....	12	41	390	2,420	1,310	3,810	10,100	1,310	484	104	24	14
.....	12	44	1,160	3,260	1,310	3,670	6,890	1,470	536	104	24	14
.....	14	51	484	11,300	1,390	3,670	3,670	1,470	510	104	22	14
.....	14	51	390	5,350	1,470	3,530	3,670	1,390	510	112	22	16
.....	14	48	348	4,870	1,470	3,390	3,950	1,390	484	112	22	18
.....	14	44	310	5,850	3,390	3,390	3,810	1,310	563	140	16	18
.....	14	151	260	3,260	3,390	3,260	3,390	1,310	536	120	16	16
.....	14	186	244	2,530	4,870	3,530	3,390	1,310	436	104	16	18
.....	14	130	214	5,680	9,590	3,530	3,130	1,240	390	104	16	18
.....	14	104	293	8,330	9,230	3,530	2,760	1,160	329	104	16	16
.....	14	90	1,390	13,900	6,530	3,390	2,420	1,310	276	90	14	14
.....	14	90	590	7,790	4,100	2,880	2,110	1,310	276	90	14	14
.....	14	90	4,100	6,530	3,950	2,210	1,920	1,310	590	68	14	16
.....	14	97	4,870	9,410	3,390	1,920	1,640	1,240	329	68	14	16
.....	14	97	1,640	7,790	3,260	1,820	1,470	955	310	44	14	16
.....	14	2,010	1,020	5,030	3,130	1,730	1,310	955	293	44	14	14
.....	14	510	1,160	4,250	2,880	1,640	1,240	955	276	27	14	14
.....	14	646	1,240	3,390	.....	1,560	1,160	955	244	32	14	14
.....	14	390	4,250	2,760	.....	1,560	1,090	1,020	214	32	14	14
.....	14	.....	34,200	2,530	.....	1,310	.....	1,020	.....	35	14	.....

—Discharge determined from a well-defined rating curve.

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Monthly discharge of Middle Eel River near Covelo, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum	Mean.		
October	14	10	12.7	781	C.
November	2,010	18	193	11,500	B.
December	34,200	130	1,970	121,000	C.
January	24,100	2,010	6,360	391,000	C.
February	9,590	1,310	2,940	163,000	C.
March	4,100	1,310	3,010	185,000	B.
April	11,100	1,090	4,150	247,000	C.
May	1,730	955	1,290	79,300	B.
June	955	214	492	29,300	B.
July	186	27	106	6,520	B.
August	32	14	20.9	1,290	C.
September	18	14	15.1	898	C.
The year	34,200	10	1,710	1,240,000	

YAGER CREEK AT CARLOTTA, CAL.

LOCATION.—In sec. 28, T. 2 N., R. 1 E., at highway bridge at Carlotta, about half a mile above junction with Van Duzen River.

DRAINAGE AREA.—146 square miles.

RECORDS AVAILABLE.—August 29, 1911, to January 21, 1914, when station was discontinued.

GAGE.—Chain gage on downstream side of bridge at same datum as original staff gage. Gage was destroyed by high water January 21, 1914.

DISCHARGE MEASUREMENTS.—Made from railroad bridge 40 feet below gage or by wading.

CHANNEL AND CONTROL.—Gravel and sand; somewhat shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 15.6 feet at 5 p. m. January 21 (stage was higher at 10 p. m., and washed out bridge and gage, gage height and discharge unknown); minimum stage recorded, 6.1 feet October 1 to 28, November 1, 9, 16, and 17 (data insufficient for estimate of discharge).

1911–1914: Maximum stage recorded, 15.7 feet at 4 p. m. January 25, 1912 (discharge, computed from extension of rating curve, 73,900 second-feet); stage January 21, 1914, probably higher; see preceding paragraph); minimum stage recorded, 5.55 feet August 30 to September 22, 1911 (discharge, 0.4 second-foot).

COOPERATION.—Gage-height record furnished by A. Sappingfield.

No discharge measurements made during the year; not practicable to prepare estimates of discharge.

Daily gage height, in feet, of Yager Creek at Carlotta, Cal., for the year ending Sept. 30, 1914.

[A. Sappingfield, observer.]

Day.	Oct.	Nov.	Dec.	Jan.	Day.	Oct.	Nov.	Dec.	Jan.
1	6.1	6.1	8.8	11.3	16	6.1	6.1	7.5	8.5
2	6.1	6.1	8.3	11.6	17	6.1	6.1	7.4	9.0
3	6.1	6.5	7.4	8.5	18	6.1	6.8	7.5	10.2
4	6.1	6.6	7.1	7.9	19	6.1	7.1	7.6	10.4
5	6.1	7.1	6.8	7.8	20	6.1	7.4	7.8	11.5
6	6.1	8.8	6.7	7.4	21	6.1	7.6	7.8	14.6
7	6.1	7.0	6.6	7.6	22	6.1	7.6	8.6	.....
8	6.1	6.6	6.6	7.5	23	6.1	7.9	8.8	.....
9	6.1	6.1	6.6	7.4	24	6.1	8.2	11.4	.....
10	6.1	6.2	6.6	7.5	25	6.1	8.3	12.2	.....
11	6.1	6.2	6.5	7.8	26	6.1	8.4	11.1	.....
12	6.1	6.2	6.4	9.0	27	6.1	7.6	8.9	.....
13	6.1	6.2	8.6	9.1	28	6.1	8.0	8.7	.....
14	6.1	6.2	8.2	11.0	29	6.15	9.1	8.7	.....
15	6.1	6.2	7.8	9.0	30	6.15	9.0	8.4	.....
					31	6.15	.....	15.6	.....

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KLAMATH RIVER BASIN.

WILLIAMSON RIVER AT CHILOQUIN, OREG.

ı.—In the NW. ¼ sec. 3, T. 35 S., R. 7 E., at highway bridge about 500 feet e mouth of Sprague River and one-half mile southwest of Chiloquin, Kla- ı County.

E AREA.—1,260 square miles.

AVAILABLE.—July 25, 1911, to September 30, 1914.

Vertical staff on upstream side of right abutment of wagon bridge, except h 29 to July 16, 1915, when a temporary gage on downstream side of abut- t was used; read once a day by employees of United States Indian Service.

GE MEASUREMENTS.—Made from upstream side of wagon bridge; conditions on account of rough bottom and uneven velocities.

AND CONTROL.—Rocks and gravel; practically permanent; a second chan- o the left of the main channel always carries some water; banks low and sub- to overflow in extreme flood.

ES OF DISCHARGE.—Maximum stage recorded during year, 5.35 feet, March 24, and 27 (discharge, 1,470 second-feet); minimum stage recorded, 3.90 October 12 to 20 (discharge, 480 second-feet).

FLOW.—Stage-discharge relation unaffected by ice, as most of the water comes springs.

ONS.—Practically none.

ION.—None.

Y.—Results apparently good except during April, when rating for temporary is uncertain.

ATION.—Field data furnished by United States Indian Office, H. W. Hincks, tant engineer.

measurements of Williamson River at Chiloquin, Oreg., during the year ending Sept. 30, 1914.

Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
	Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
R. R. Randell	4.30	609	Mar. 24	J. W. Malin	5.35	1,540
J. W. Malin	4.42	648	May 4	do	4.70	1,080
do	4.90	1,070	9	do	4.60	908
do	5.00	1,220	July 14	do	4.08	563

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Daily discharge, in second feet, of Williamson River at Chiloquin, Oreg., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	750	585	690	690	690	750	1,340	1,110	760	630	510	510
2	480	510	690	720	690	750	1,340	1,110	760	630	510	510
3	635	510	690	750	690	750	1,340	1,110	690	630	510	510
4	690	510	690	750	690	820	1,460	1,010	690	570	510	510
5	517	585	690	750	690	820	1,460	1,010	690	570	510	510
6	524	545	690	750	690	890	1,460	1,010	690	570	510	508
7	585	585	690	820	690	970	1,460	920	690	570	510	506
8	750	585	690	820	690	970	1,460	920	690	570	510	504
9	510	585	690	820	690	1,050	1,460	920	690	570	510	510
10	510	585	690	820	690	1,050	1,460	920	690	570	510	510
11	510	585	690	820	690	1,050	1,460	920	690	570	510	510
12	480	585	690	820	690	1,140	1,460	920	690	570	510	510
13	480	585	690	820	690	1,140	1,460	840	690	570	510	504
14	480	585	690	820	690	1,140	1,460	840	690	570	510	504
15	495	585	690	820	690	1,140	1,460	840	690	570	510	507
16	480	635	690	820	690	1,230	1,340	840	630	520	510	510
17	480	635	690	820	690	1,230	1,340	840	630	585	510	510
18	480	635	690	820	690	1,320	1,340	840	630	585	510	510
19	480	635	690	750	690	1,320	1,340	760	630	565	510	510
20	480	635	690	690	690	1,420	1,340	760	630	545	510	510
21	495	635	690	690	690	1,420	1,340	760	630	545	510	510
22	495	635	690	690	690	1,420	1,340	760	630	545	510	510
23	510	635	690	635	690	1,420	1,340	760	630	545	510	510
24	510	635	690	690	690	1,520	1,220	760	630	545	510	510
25	510	635	638	750	690	1,320	1,220	760	630	545	510	510
26	510	690	585	750	690	1,420	1,110	760	630	545	510	510
27	510	635	585	690	690	1,520	1,110	760	630	545	510	510
28	545	635	585	690	690	1,320	1,110	760	630	545	510	510
29	545	690	610	690	.....	1,460	1,110	760	630	510	510	510
30	585	690	635	690	.....	1,460	1,110	760	630	510	510	510
31	585	.....	635	690	.....	1,340	.....	760	.....	510	510	.....

NOTE.—Discharge, except from Mar. 29 to July 16, determined from a fairly well defined rating curve. Temporary gage a few feet downstream from the site of the regular gage read from Mar. 29 to July 16, and discharge determined from a fairly well defined rating curve. Discharge interpolated for Sundays except during high stages.

Monthly discharge of Williamson River at Chiloquin, Oreg., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	750	480	535	32,900	B.
November	690	510	607	36,100	B.
December	690	585	672	41,300	B.
January	820	635	753	46,300	B.
February	690	690	690	38,300	B.
March	1,520	750	1,180	72,600	B.
April	1,460	1,110	1,340	79,700	C.
May	1,110	760	865	53,200	B.
June	760	630	665	39,600	B.
July	630	510	562	34,600	B.
August	510	510	510	31,400	B.
September	510	504	509	30,300	B.
The year	1,520	480	741	536,000	

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UPPER KLAMATH LAKE NEAR KLAMATH FALLS, OREG.

LOCATION.—In sec. 30, T. 38 S., R. 9 E., at the outlet of Upper Klamath Lake, about 2 miles northwest of Klamath Falls.

RECORDS AVAILABLE.—May 28 to October 22, 1904; January 7, 1906, to September 30, 1914.

GAGE.—Friez water-stage recorder since February 16, 1906; vertical staff prior to that date; zero is 4,136.13 feet above sea level. Graham Keihl, observer.

EXTREMES OF STAGE.—Maximum stage recorded during year, 6.97 feet at 8. p. m. April 20; lowest stage recorded, 3.98 feet September 17, when the river at the outlet of the lake is said to have been practically dry.

FLUCTUATION.—Gage readings much affected by wind. The water is lowered near the outlet when the wind blows from the south, and is raised as much above its normal level when the wind is in the opposite direction. There is a periodic oscillation when the wind blows for any considerable time.

COOPERATION.—Since May, 1909, station has been maintained by United States Reclamation Service.

Daily gage height, in feet, of Upper Klamath Lake, near Klamath Falls, Oreg., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	4.44	4.45	4.98	.....	.....	.....	6.06	.....	5.85	5.00	4.43	4.20
2	4.43	4.60	4.91	5.24	.....	.....	6.06	6.26	5.90	5.05	4.43	4.12
3	4.63	4.50	4.85	5.20	.....	.....	6.00	6.30	6.00	5.10	4.48	4.24
4	4.50	4.44	4.84	5.10	.....	.....	6.05	6.22	6.10	5.10	4.50	4.30
5	4.50	4.44	4.84	5.15	.....	.....	6.16	.....	.....	4.90	4.50	4.30
6	4.30	4.60	4.84	4.90	.....	.....	6.15	.....	5.00	4.90	4.52	4.24
7	4.28	4.63	4.85	5.28	5.50	5.60	6.15	.....	.....	5.00	4.48	4.20
8	4.58	4.55	4.85	5.38	.....	5.60	6.10	6.00	.....	4.94	4.42	.....
9	4.55	4.68	4.86	.....	.....	5.64	6.09	6.10	.....	4.85	4.43	.....
10	4.40	4.72	4.66	5.10	.....	5.70	6.30	6.10	.....	4.80	4.40	.....
11	4.38	4.68	4.89	5.10	.....	5.68	6.20	6.08	.....	4.68	4.34	.....
12	4.30	4.71	4.75	4.90	.....	5.80	6.19	6.04	.....	4.68	4.32	4.15
13	4.55	4.80	4.80	5.25	.....	5.90	6.18	.....	5.30	4.80	4.30	4.30
14	4.55	4.65	.....	5.20	5.35	5.95	6.16	.....	5.38	4.76	4.30	4.50
15	.....	4.65	.....	5.34	.....	.....	6.38	.....	5.40	4.75	4.32	4.58
16	.....	4.61	.....	4.90	.....	.....	6.35	5.95	5.35	4.78	4.50	4.48
17	.....	4.59	.....	5.10	.....	.....	6.28	6.00	5.34	4.68	4.35	4.10
18	4.45	4.78	.....	5.48	5.19	.....	6.25	5.95	5.34	4.64	4.35	4.50
19	.....	4.71	.....	.....	5.17	.....	6.40	5.88	5.38	.....	4.33	4.50
20	.....	4.95	4.87	.....	5.19	.....	6.44	.....	5.52	4.82	4.33	4.98
21	.....	4.90	4.82	.....	5.32	6.10	6.48	.....	.....	4.68	4.32	4.92
22	.....	4.65	4.96	.....	.....	6.19	6.29	.....	5.14	4.60	4.30	4.85
23	.....	4.77	.....	.....	.....	6.30	6.20	5.90	.....	4.52	4.28	4.72
24	.....	4.58	.....	5.60	.....	6.25	6.22	.....	5.16	4.48	4.38	4.58
25	4.60	4.60	.....	5.54	.....	6.25	6.20	.....	.....	4.50	.....	4.40
26	.....	4.48	.....	5.55	.....	6.25	.....	.....	.....	4.49	.....	4.57
27	.....	4.95	4.90	.....	.....	6.17	.....	6.10	5.00	4.52	4.27	4.45
28	.....	4.57	.....	.....	5.45	5.41	.....	.....	5.10	4.43	4.30	4.38
29	4.48	4.92	.....	.....	.....	5.80	6.60	.....	5.05	4.40	4.26	4.34
30	4.46	4.98	.....	.....	.....	6.05	.....	5.65	5.10	4.35	4.29	4.38
31	4.38	.....	5.14	5.55	.....	6.07	.....	5.70	.....	4.43	4.29	.....

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LINK RIVER AT KLAMATH FALLS, OREG.

LOCATION.—In the SW. ¼ sec. 32, T. 38 S., R. 9 E., at county bridge over Link River, at Klamath Falls, Klamath County, 1¼ miles below outlet of Upper Klamath Lake and immediately above the head of Lake Ewauna.

DRAINAGE AREA.—3,110 square miles.

RECORDS AVAILABLE.—May 15, 1914, to September 30, 1914.

GAGE.—Friez water-stage recorder on left bank about 500 yards above bridge. Friez recorder on opposite bank and a little farther upstream was used June 6, 1908, to August 30, 1912. A chain gage on the bridge has been read daily since 1904, and has been used for obtaining the discharge for periods when gage heights are not available from the other gage. Gertrude Beals, observer.

DISCHARGE MEASUREMENTS.—Made from bridge.

CHANNEL AND CONTROL.—Rocks and boulders in rapids, mud and sand at bridge. Control for gage evidently permanent; water from the tailrace of the plant of the California-Oregon Power Co. enters the river opposite the gage and apparently affects the gage height in the same manner as if the water came down the river channel. Stage-discharge relation at the chain gage is affected by backwater from Lake Ewauna, especially when the wind is blowing.

EXTREMES OF DISCHARGE.—Maximum stage during year from water stage recorder, 7.85 feet at 9 a. m. April 20 (discharge, 4,900 second-feet); minimum stage recorded 4.65 feet (discharge, estimated from extension of rating curve, 500 second-feet, the flow may have been even less).

WINTER FLOW.—Stage-discharge relation not affected by ice.

DIVERSION.—The A canal of the Klamath project of the United States Reclamation Service diverts water from lower end of Upper Klamath Lake. For record of this diversion see page 300. Some water is also diverted for irrigation from tributaries of Upper Klamath Lake, but the total run-off is as yet practically unaffected.

REGULATION.—The only artificial regulation is the small effect of the operation of the power plant. There are marked natural fluctuations caused by the effect of wind on Upper Klamath Lake.

ACCURACY.—Results apparently good.

COOPERATION.—Most of the field data furnished by the United States Reclamation Service.

Discharge measurements of Link River at Klamath Falls, Oreg., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Nov. 13	R. R. Randell	5.76	1,730	July 8	C. E. Maxwell	6.10	2,100
18	do	5.77	1,750	Sept. 20	do	5.36	1,100

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charge, in second-feet, of Link River at Klamath Falls, Oreg., for year ending Sept. 30, 1914.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	1,350	1,460	1,830	2,320	3,120	3,200	3,980	4,300	3,350	2,300	1,280	1,000
.....	1,350,	1,540	1,800	2,420	3,080	3,120	3,980	4,300	3,350	2,300	1,240	950
.....	1,500	1,470	1,770	2,450	3,080	3,120	3,980	4,380	3,420	2,300	1,230	1,000
.....	1,350	1,450	1,770	2,450	3,050	3,120	3,980	4,300	3,420	2,150	1,290	1,040
.....	1,230	1,360	1,770	2,480	3,020	3,120	3,980	4,300	3,200	2,000	1,290	1,060
.....	1,170	1,430	1,760	2,380	2,980	3,200	3,980	4,140	2,900	1,970	1,250	1,060
.....	1,350	1,450	1,730	2,600	2,930	3,200	4,060	4,060	3,120	1,970	1,250	1,090
.....	1,470	1,470	1,730	2,700	2,930	3,200	3,980	4,060	3,050	1,860	1,180	1,000
.....	1,350	1,660	1,730	2,570	2,930	3,280	4,060	4,060	3,050	1,830	1,230	1,060
.....	1,310	1,650	1,600	2,520	2,930	3,350	4,060	3,980	3,050	1,730	1,170	1,040
.....	1,290	1,610	1,690	2,420	2,930	3,420	4,220	3,900	3,050	1,780	1,110	1,180
.....	1,250	1,660	1,600	2,150	2,900	3,420	4,140	3,820	2,980	1,730	1,100	1,060
.....	1,400	1,810	1,660	2,570	2,880	3,500	4,140	3,820	2,828	1,830	1,090	1,040
.....	1,390	1,700	1,800	2,520	2,900	3,500	4,140	3,820	2,900	1,780	1,070	920
.....	1,290	1,550	1,830	2,680	2,900	3,500	4,380	3,820	2,900	1,730	1,090	980
.....	1,330	1,540	1,860	2,360	2,900	3,500	4,380	3,740	2,820	1,700	1,210	780
.....	1,350	1,540	1,870	2,510	2,900	3,580	4,380	3,660	2,750	1,630	1,090	650
.....	1,350	1,640	1,860	2,870	2,900	3,580	4,380	3,660	2,750	1,570	1,090	840
.....	1,350	1,570	1,860	2,900	2,900	3,660	4,380	3,580	2,680	1,540	1,060	1,120
.....	1,350	1,660	1,940	2,930	2,900	3,740	4,380	3,580	2,600	1,630	1,060	1,210
.....	1,350	1,660	1,940	2,990	2,900	3,660	4,470	3,500	2,450	1,570	1,080	1,210
.....	1,350	1,680	1,940	3,140	2,900	3,820	4,470	3,500	2,450	1,500	1,060	1,210
.....	1,350	1,730	1,950	3,080	2,900	3,900	4,380	3,500	2,300	1,450	1,070	1,180
.....	1,420	1,600	1,950	3,140	2,980	3,900	4,300	3,580	2,450	1,430	1,070	1,170
.....	1,410	1,660	1,960	3,200	3,050	3,980	4,300	3,580	2,600	1,410	1,000	1,090
.....	1,410	1,630	1,960	3,170	3,050	3,980	4,300	3,500	2,520	1,370	1,000	1,230
.....	1,420	1,860	1,960	3,170	2,980	3,820	4,300	3,660	2,450	1,340	1,000	1,160
.....	1,460	1,600	1,970	3,170	3,050	3,350	4,300	3,500	2,450	1,340	1,070	1,110
.....	1,450	1,850	1,980	3,140	.....	3,660	4,300	3,500	2,450	1,290	1,020	1,040
.....	1,410	1,860	2,000	3,100	.....	3,820	4,300	3,420	2,450	1,210	1,090	1,110
.....	1,370	.....	2,340	3,100	.....	3,980	.....	3,350	.....	1,300	1,040	.....

Discharge determined from a well-defined rating curve. Discharge Dec. 21–26 and Apr. 26 to polated; Dec. 28–30 estimated.

lischarge of Link River at Klamath Falls, Oreg., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
.....	1,500	1,170	1,360	83,600	B.
.....	1,860	1,360	1,610	95,800	B.
.....	2,340	1,600	1,850	114,000	B.
.....	3,200	2,150	2,750	169,000	B.
.....	3,120	2,880	2,960	164,000	B.
.....	3,980	3,120	3,520	216,000	B.
.....	4,470	3,980	4,210	251,000	B.
.....	4,380	3,350	3,800	234,000	B.
.....	3,420	2,300	2,820	168,000	B.
.....	2,300	1,210	1,690	104,000	B.
.....	1,290	1,000	1,130	69,500	B.
.....	1,230	650	1,050	62,500	B.
'ear	4,470	650	2,390	1,730,000	

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Total monthly discharge [a] of Link River at Klamath Falls, Oreg., for the years ending Sept. 30, 1910–1914.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1910–11.					
October	1,670	1,170	1,420	87,300	B.
November	2,370	1,140	1,710	102,000	B.
December	3,800	2,210	3,190	196,000	B.
January	3,200	2,610	2,920	180,000	B.
February	2,620	1,840	2,160	120,000	B.
March	5,210	1,890	3,290	202,000	B.
April	.....	.....	5,190	309,000	D.
May	5,890	.....	4,640	285,000	C.
June	.....	3,170	3,670	218,000	D.
July	3,290	1,400	2,470	152,000	C.
August	2,470	1,290	1,680	103,000	C.
September	1,500	1,140	1,340	79,700	C.
The year	5,890	1,140	2,810	2,030,000	
1911–12.					
October	1,670	1,260	1,460	89,800	B.
November	2,200	1,360	1,770	105,000	B.
December	2,200	1,690	1,820	112,000	C.
January	2,160	1,670	1,860	114,000	C.
February	3,310	2,200	2,550	147,000	B.
March	3,650	2,610	3,220	198,000	B.
April	3,810	1,880	2,880	171,000	B.
May	3,040	2,400	2,690	165,000	B.
June	3,050	2,400	2,790	166,000	B.
July	2,580	1,740	2,210	136,000	C.
August	2,060	1,360	1,780	109,000	C.
September	.....	.....	1,460	86,900	B.
The year	3,810	1,260	2,210	1,600,000	
1912–13.					
October	1,640	1,270	1,440	88,500	B.
November	2,000	1,450	1,790	107,000	B.
December	2,220	1,800	2,000	123,000	B.
January	2,450	2,080	2,260	139,000	B.
February	2,220	2,000	2,090	116,000	B.
March	2,450	2,000	2,160	133,000	B.
April	4,060	2,300	3,370	201,000	B.
May	3,760	3,400	3,570	220,000	B.
June	3,570	2,750	3,120	186,000	B.
July	2,790	2,090	2,350	144,000	B.
August	2,140	1,580	1,830	113,000	B.
September	1,650	1,250	1,420	84,500	B.
The year	4,060	1,250	2,280	1,660,000	
1913–14.					
October	1,500	1,170	1,360	83,600	B.
November	1,860	1,360	1,610	95,800	B.
December	2,340	1,600	1,850	114,000	B.
January	3,200	2,150	2,750	169,000	B.
February	3,120	2,880	2,960	164,000	B.
March	3,980	3,120	3,520	216,000	B.
April	4,470	3,980	4,210	251,000	B.
May	4,440	3,570	3,970	244,000	B.
June	3,640	2,480	2,990	178,000	B.
July	2,420	1,520	1,930	119,000	B.
August	1,550	1,080	1,260	77,500	B.
September	1,240	655	1,090	64,900	B.
The year	4,470	655	2,460	1,780,000	

[a] Includes discharge of "A" canal. See p. 300.

LOWER KLAMATH LAKE NEAR BROWNELL, CAL.

LOCATION.—In sec. 35, T. 47 N., R. 2 E., at Laird's landing at the extreme southern end of Klamath Lake, about 6 miles southeast of Brownell, Siskiyou County.

RECORDS AVAILABLE.—August 1, 1912, to September 30, 1914.

GAGE.—Vertical staff on northeast bent of wharf; datum, 4,084 feet above sea level. Observer, Marguerite Laird.

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IES OF STAGE.—Maximum stage recorded during year, 2.4 feet April 28 and minimum stage, zero September 16 to 18.

ATION.—Records furnished by United States Reclamation Service.

ge height, in feet, of Lower Klamath Lake near Brownell, Cal., for the year ending Sept. 30, 1914.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
.....	0.6	0.8	0.7	1.0	1.7	1.8	1.9	2.3	2.2	1.7	0.7	0.3
.....	.6	.8	.9	1.0	1.7	1.8	1.9	2.3	2.1	1.7	.7	.3
.....	.7	.8	.9	1.0	1.7	1.8	1.9	2.3	2.1	1.6	.7	.3
.....	.7	.8	.9	1.0	1.7	1.8	2.0	2.3	2.1	1.6	.7	.3
.....	.7	.4	.9	1.0	1.7	1.8	2.0	2.3	2.1	1.6	.7	.3
.....	.7	.4	.9	.8	1.7	1.8	2.0	2.3	2.1	1.5	.6	.3
.....	.4	.7	.9	1.0	1.7	1.8	2.0	2.2	2.1	1.5	.6	.3
.....	.4	.7	.9	1.2	1.7	1.8	2.0	2.2	2.1	1.4	.6	.3
.....	.5	.7	.9	1.2	1.7	1.8	2.0	2.2	2.1	1.3	.6	.2
.....	.5	.7	.7	1.2	1.7	1.8	2.0	2.3	2.1	1.3	.6	.2
.....	.5	.7	.7	1.2	1.7	1.8	2.1	2.3	2.1	1.3	.6	.4
.....	.2	.7	.9	1.0	1.7	1.6	2.1	2.2	2.0	1.3	.6	.3
.....	.2	.7	.9	1.0	1.8	1.8	2.0	2.2	2.0	1.2	.6	.3
.....	.2	.7	.9	1.0	1.8	1.9	2.0	2.2	2.0	1.2	.5	.3
.....	.4	.7	.9	1.0	1.8	1.9	2.0	2.2	2.0	1.2	.6	.2
.....	.4	.7	.9	1.2	1.8	1.9	2.0	2.2	2.0	1.2	.6	.0
.....	.4	.4	1.0	1.2	1.7	1.9	2.0	2.2	2.0	1.2	.5	.0
.....	.5	.7	1.0	1.2	1.7	1.9	2.2	2.2	1.9	1.2	.5	.0
.....	.5	.7	1.0	1.2	1.7	1.9	2.2	2.2	1.8	1.2	.5	.1
.....	.5	.7	1.0	1.2	1.6	1.9	2.2	2.2	1.8	1.2	.5	.2
.....	.5	.9	1.0	1.2	1.7	1.9	2.3	2.2	1.8	1.2	.5	.1
.....	.7	.9	1.0	1.5	1.7	1.9	2.3	2.2	1.8	1.0	.5	.1
.....	.7	.9	1.0	1.6	1.8	1.9	2.3	2.2	1.5	1.0	.5	.2
.....	.7	.9	1.0	1.6	1.8	2.0	2.3	2.2	1.8	1.0	.5	.2
.....	.7	.5	1.0	1.1	1.8	2.0	2.3	2.3	1.8	1.0	.5	.2
.....	.7	.5	1.0	1.5	1.8	1.8	2.3	2.3	1.8	.9	.4	.2
.....	.7	.7	1.0	1.1	1.8	1.8	2.3	2.3	1.8	.9	.4	.2
.....	.7	.7	1.0	1.1	1.8	1.6	2.4	2.2	1.7	.9	.4	.3
.....	.4	.7	1.0	1.1	.....	1.6	2.4	2.2	1.7	.9	.4	.3
.....	.4	.7	1.0	1.7	.....	1.6	2.3	2.2	1.7	.8	.4	.3
.....	.7	.....	1.0	1.7	.....	1.7	.....	2.2	.....	.8	.4	.....

KLAMATH RIVER NEAR SEIAD VALLEY, CAL.

N.—In the NE. ¼ sec. 13, T. 46 N., R. 12 W., above highway bridge, 300 feet /e mouth of Walker Creek, 11½ miles below mouth of Scott River, and 1½ s southeast of Seiad Valley.

E AREA.—Not measured.

S AVAILABLE.—November 23, 1912, to September 30, 1914.

Staff in five sections fastened to trees on left bank one-fourth mile above way bridge. Observer, M. J. Brickley.

GE MEASUREMENTS.—Made from cable 35 feet below gage.

L AND CONTROL.—Gravel and boulders; fairly permanent.

ES OF DISCHARGE.—1913–1914: Maximum stage recorded, 13.3 feet at 9.30 1. December 31, 1913 (discharge, computed from extension of rating curve, 00 second-feet); minimum stage recorded, 3.6 feet September 3 to 15, 1914 charge, 1,660 second-feet).

ONS.—Water is diverted from main river and tributaries above the station se in irrigation, placer mining, and power development.

Y.—Rating curve well defined except for high stages; results good.

llowing discharge measurement was made by H. J. Tompkins:

3, 1914: Gage height, 5.48 feet; discharge, 4,670 second-feet.

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Daily discharge, in second-feet, of Klamath River near Seiad Valley, Cal., for the ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Se
1	2,150	2,280	2,860	23,300	7,230	8,940	7,700	7,700	7,940	4,440	2,280	1
2	2,150	2,280	2,860	13,800	6,770	9,450	7,700	7,700	7,700	4,440	2,280	1
3	2,150	2,280	2,860	17,600	6,540	8,940	8,190	7,940	7,700	4,250	2,280	1
4	2,150	2,410	2,860	10,500	6,100	8,690	8,190	7,940	6,770	4,250	2,280	1
5	2,150	2,550	2,860	9,450	5,880	8,690	9,190	7,940	6,770	4,060	2,150	1
6	2,150	3,700	2,700	8,190	5,880	9,710	9,190	7,940	6,770	4,060	2,150	1
7	2,150	3,350	2,700	8,440	5,880	9,970	9,190	8,190	6,320	4,060	2,150	1
8	2,150	2,860	2,860	9,190	5,660	9,970	9,190	8,190	6,320	4,060	2,150	1
9	2,150	2,550	2,860	7,460	5,660	10,500	10,500	8,190	6,320	4,060	2,020	1
10	2,150	2,550	2,700	6,770	5,660	10,390	10,500	7,940	5,880	3,700	2,020	1
11	2,150	2,550	2,700	6,100	5,660	10,800	10,800	7,940	5,660	3,700	2,020	1
12	2,150	2,550	2,860	5,880	5,880	10,800	9,710	8,190	5,660	3,520	2,020	1
13	2,150	2,550	2,860	5,660	5,880	10,800	9,710	8,190	5,660	3,180	2,020	1
14	2,150	2,550	2,860	5,660	5,880	10,800	10,500	8,190	5,660	3,180	2,020	1
15	2,150	2,550	2,860	5,880	5,880	10,800	11,800	9,190	5,660	3,180	1,900	1
16	2,150	2,550	2,860	6,320	5,880	10,200	11,800	9,190	5,660	3,180	1,900	1
17	2,140	2,860	2,860	6,320	5,880	10,200	10,800	9,190	5,440	3,020	1,900	1
18	2,150	2,860	2,860	7,230	5,880	10,500	9,970	9,190	5,230	3,020	1,900	1
19	2,150	2,700	3,020	6,320	7,700	10,500	10,500	8,940	5,230	3,020	1,900	1
20	2,150	2,700	3,020	6,540	10,200	10,500	10,500	8,690	5,230	3,020	1,900	1
21	2,150	2,700	3,020	7,940	12,900	10,500	10,500	9,190	5,030	2,700	1,900	1
22	2,150	2,700	3,020	19,400	14,300	10,500	10,500	9,710	5,030	2,700	1,900	1
23	2,150	2,700	3,020	14,000	10,500	10,500	10,200	9,190	5,030	2,700	1,900	1
24	2,150	2,700	3,020	12,400	8,940	10,500	9,450	8,940	4,830	2,700	1,900	1
25	2,150	2,700	3,180	11,800	8,940	10,200	8,940	8,940	4,830	2,700	1,900	1
26	2,280	2,860	3,180	16,000	8,190	9,190	8,190	8,940	4,830	2,700	1,900	1
27	2,280	3,020	3,180	10,500	7,940	9,190	8,190	9,190	4,830	2,700	1,900	1
28	2,280	3,020	3,180	9,970	7,940	8,190	7,940	8,940	4,630	2,550	1,780	1
29	2,280	3,020	3,700	8,440	.....	7,940	7,940	8,940	4,440	2,280	1,780	1
30	2,280	3,020	4,440	7,940	.....	7,940	7,940	8,940	4,440	2,280	1,780	1
31	2,280	.....	9,970	7,700	.....	7,940	.....	8,940	.....	2,280	1,780	...

NOTE.—Discharge determined from a rating curve well defined below 9,200 second-feet.

Monthly discharge of Klamath River near Seiad Valley, Cal., for the year ending S 30, 1914.

Month.	Discharge in second feet.			Run-off (in acre-feet).	A ra
	Maximum.	Minimum.	Mean.		
October	2,280	2,150	2,180	134,000	B
November	3,700	2,280	2,720	162,000	B
December	9,970	2,700	3,220	198,000	B
January	23,300	5,660	9,760	600,000	A
February	14,300	5,660	7,340	408,000	A
March	10,800	7,940	9,810	603,000	A
April	11,800	7,700	9,510	566,000	A
May	9,710	7,700	8,590	528,000	A
June	7,940	4,440	5,720	340,000	A
July	4,440	2,280	3,280	202,000	B
August	2,280	1,780	1,990	122,000	B
September	2,150	1,660	1,800	107,000	B
The year	23,300	1,660	5,480	3,970,000	

KLAMATH RIVER NEAR REQUA, CAL.

LOCATION.—In sec. 29, T. 13 N., R. 2 E., at Scofield Ferry, 30 miles below mouth Trinity River, and about 9 miles above Requa and the mouth of the river.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—December 25, 1910, to September 30, 1914.

GAGE.—Staff in four sections on right bank at ferry cable. Observer, Clifford McBe

DISCHARGE MEASUREMENTS.—Made from car on ferry cable.

CHANNEL AND CONTROL.—Gravel; fairly permanent.

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EXTREMES OF STAGE.—Maximum stage recorded during year, 27.0 feet at 9 a. m. January 22 (discharge, 130,000 second-feet); minimum stage recorded, 5.9 feet September 2 and 3 (discharge, 2,980 second-feet).

1911–1914: Maximum stage recorded, 28.5 feet at 9 p. m. February 17, 1912 (discharge, 142,000 second-feet); minimum stage recorded, 5.3 feet September 23 and 24, 1911.(discharge, 2,440 second-feet).

DIVERSIONS.—Water is diverted for irrigation and power development from main river and tributaries in Oregon and California.

ACCURACY.—Rating curve fairly well defined; results good.

No discharge measurements were made during the year.

Daily discharge, in second-feet, of Klamath River near Requa, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	3,380	3,540	14,400	101,000	37,900	47,100	24,400	26,400	24,800	12,000	4,500	3,100
2	3,380	3,720	11,400	112,000	34,900	45,700	25,400	27,400	25,400	12,000	4,500	2,980
3	3,240	3,900	10,000	119,000	33,700	42,100	28,400	27,900	23,400	12,000	4,300	2,980
4	3,240	9,720	9,100	81,700	32,500	39,100	30,700	28,400	32,500	11,400	4,100	3,100
5	3,240	16,800	8,500	72,300	30,100	36,100	59,700	29,600	19,800	10,700	4,100	3,100
6	3,380	26,800	8,200	71,600	28,400	39,700	49,200	29,000	20,300	10,000	3,900	3,100
7	3,540	16,000	7,900	63,900	27,900	42,700	39,100	29,000	20,300	9,400	4,100	3,240
8	4,100	10,700	7,600	59,700	26,400	44,500	35,500	28,400	19,000	9,100	4,100	3,240
9	4,500	7,600	7,320	55,500	25,400	45,100	50.600	27,900	17,200	9,100	4,100	3.240
10	4,100	7,040	7,040	45,100	24,400	46,400	53,400	27,400	16,800	8,800	3,720	3,100
11	3,720	6,200	7,600	38,500	25.400	45,700	49,200	26,400	16,800	8,800	3,720	3,100
12	3,720	5,680	8,800	37.300	26,400	45,700	45,100	27,400	16,400	8,800	3,720	3,100
13	3,720	5,420	10,000	36,700	25,800	45,100	42,700	27,900	16,000	8,500	3,720	3,100
14	3,720	5,180	10,700	43,900	25,800	44,500	49,200	29,600	15,200	8,200	3,540	3,240
15	3,720	4,940	11,700	52,700	24,400	44,500	56,200	31,300	16,000	7,600	3,540	3,240
16	3,720	4,940	10,700	44,500	32,500	43,300	58,300	30,700	16,800	7,320	3,540	4,500
17	3,720	5,420	10,000	45,700	31,300	42,700	47,100	30,100	17,600	7,040	3,540	5,940
18	3,720	6,760	9,400	43.900	23,000	42.100	45,700	29,000	17,600	7,040	3,540	8,800
19	3,540	7,320	9,100	43,300	42,700	42,100	45,700	29,000	16,800	6,760	3,380	7.900
20	3,540	7,900	10,400	43,300	49,200	42,700	45,100	29,000	16,000	6,760	3,380	7,320
21	3,540	7,900	11.700	60,400	73,700	42,100	40,900	29,000	14,000	6,480	3,380	4,100
22	3,540	7,600	13,200	125,000	76,100	42,100	38,500	29,000	11,400	6,200	3,380	3,900
23	3,540	6,200	12,800	109,000	67,400	42,100	35,500	29,600	12,800	5,940	3,240	3,720
24	3,540	7,040	12,800	88,100	50,600	39,100	32,500	29.000	14,400	5,940	3,240	3,720
25	3,380	7,040	21,200	89,700	47,800	35,500	26,800	29,000	15,600	5,680	3,240	3,540
26	3,380	7,600	18,500	103,000	45,700	27,900	25,800	26.800	14,400	5,420	3,100	3,540
27	3,380	10,700	14,800	89,700	40,900	29,000	27,900	23,900	12,800	5,420	3,100	3,720
28	3,380	19,400	14,000	86,500	42,700	28,400	26,800	23,000	12,400	5,180	3,100	3,540
29	3,380	21,200	13,600	63,900	.....	27,400	26,400	23,000	12,000	4,940	3,100	3,540
30	3,380	17,600	22,600	45,700	.....	26,800	26,400	24,400	12,000	4,940	3,100	3,540
31	3,380	.....	69,500	39,700	.....	25,400	.....	24,800	.....	4,720	3,100	.....

NOTE.—Discharge determined from a rating curve well defined below 60,000 second-feet.

Monthly discharge of Klamath River near Requa, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	4,500	3,240	3,570	220,000	B.
November	26,800	3,540	9,260	551,000	B.
December	69,500	7,040	13,400	824,000	A.
January	125,000	36,700	68,100	4,190,000	A.
February	76,100	23,000	37,600	2,090,000	A.
March	47,100	25,400	39,800	2,450,000	A.
April	59,700	24,400	39,600	2,360,000	A.
May	31,300	23,000	27,800	1,710,000	A.
June	32,500	11,400	17,200	1,020,000	A.
July	12,000	4,720	7,810	480,000	B.
August	4,500	3,100	3,620	223,000	B.
September	8,800	2,980	3,940	234,000	B.
The year	125,000	2,980	22,600	16,400,000	

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MILLER CREEK NEAR CRESCENT, OREG.

LOCATION.—In sec. 2, T. 28 S., R. 7 E., about 4 miles above the Knott ranch and about 20 miles south of Crescent, Klamath County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—November 14, 1911, to December 31, 1912; August 17, 1913, to November 7, 1914, when station was discontinued.

GAGE.—Vertical staff; read weekly by Fred Zumbrum.

DISCHARGE MEASUREMENTS.—Made by wading and from foot log.

CHANNEL AND CONTROL.—Sand and gravel; somewhat shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.44 feet June 6 (discharge, 68 second-feet); minimum stage recorded, 0.64 foot (discharge, 5.6 second-feet); but the estimated discharge for January 10 and 31, when the stream was covered with ice, is 5 second-feet.

WINTER FLOW.—Stage-discharge relation materially affected by ice; discharge estimated.

DIVERSIONS.—None; water sinks into ground probably beginning to some extent above the gage and has disappeared within a few miles below.

REGULATION.—None.

ACCURACY.—Results apparently fair for the open season and poor for the winter months; weekly readings may not give the true mean closely; rating curve is uncertain owing to small number of measurements.

The following measurement was made by J. E. Stewart:

August 5, 1914: Gage height, 1.07 feet; discharge, 14.7 second-feet.

Daily gage height, in feet, of Miller Creek near Crescent, Oreg., for the year ending Sept. 3[illegible] 1913.

Day.	Oct.	Nov.	Dec.	Aug.	Sept.	Day.	Oct.	Nov.	Dec.	Aug.	Sept.
1912-13.						1912-13.					
1			1.70			16			1.80		
2						17				1.11	
3						18					
4		0.95				19					
5	0.55					20		1.40			0.80
6					1.10	21	0.72				
7						22			1.60		
8						23					
9			1.87			24					
10						25					
11						26					
12	.64	1.05				27					.70
13					.85	28	.78	1.60			
14						29					
15						30				1.45	
						31			1.23		

NOTE.—No estimates of discharge made Oct. 1, 1912, to Aug. 16, 1913.

Daily discharge, in second-feet, of Miller Creek near Crescent, Oreg., for the period Aug. 17, 1913, to Nov. 7, 1914.

Day.	Aug.	Sept.	Day.	Aug.	Sept.	Day.	Aug.	Sept.
1913.			1913.			1913.		
1			11			21		
2			12			22		
3			13		9	23		
4			14			24		
5			15			25		
6		14	16			26		
7			17	14		27		
8			18			28		
9			19			29		
10			20		8	30	24	
						31		

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Daily discharge, in second-feet, of Miller Creek near Crescent, Oreg., for the period Aug. 17, 1913, to Nov. 7, 1914—Continued.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1913-14.														
1		5.8												
2								25						
3				6									10	
4	5.9						12			32				
5											13	7.7		
6			8						68					
7					19	14								11
8		7.8									13			
9								26						
10				5									11	
11	6.4						12			27				
12												7.2		
13			7						51					
14					24	13								
15		8.4									10			
16								30						
17				6									11	
18	5.6						18			20				
19												12		
20			7						44					
21					32	12								
22		8.4									10			
23								42						
24				6									12	
25	5.9						21			17				
26												10		
27			7						38					
28					15	12								
29		9.0									8			
30								45						
31				5									13	

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge Dec. 6, 1913, to Feb. 21, 1914, estimated on account of ice.

Monthly discharge of Miller Creek near Crescent, Oreg., for the year ending Sept. 30, 1914.

Month.	Mean discharge in second-feet.	Run-off (total in acre-feet).	Month.	Mean discharge in second-feet.	Run-off (total in acre-feet).
October	5.95	366	May	33.6	2,070
November	7.88	469	June	50.2	2,990
December	7.2	443	July	24.0	1,480
January	5.6	344	August	10.8	664
February	22.5	1,250	September	9.22	549
March	12.8	787			
April	15.8	940	The year	17.1	12,400

SPRAGUE RIVER NEAR YAINAX, OREG.

LOCATION.—In N.W. ¼ sec. 20, T. 36 S., R. 13 E., about 1½ miles above the highway bridge on the road from Yainax to Silver Lake, about 5 miles above the mouth of Sycan River and about 10 miles east of Yainax, Klamath County.

DRAINAGE AREA.—513 square miles.

RECORDS AVAILABLE.—April 19, 1912, to September 30, 1914.

GAGE.—Stevens water-stage recorder on left bank, installed February 20, 1914, at site of vertical staff gage, which was read about once a week prior to that date. Orval Smyth and J. L. Beatty, observers.

DISCHARGE MEASUREMENTS.—Made from cable 100 feet below gage.

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CHANNEL AND CONTROL.—Sand and gravel; no defined control, as stream is very sluggish for miles above and below gage; banks overflow at about 5 foot stage and considerable water may flow in a cut-off across a bend to right of station.

EXTREMES OF DISCHARGE.—Maximum stage from water-stage recorder, 5.41 feet, April 17 (discharge, 961 second-feet); minimum stage, 0.79 foot (discharge, 115 second-feet).

WINTER FLOW.—Stage-discharge relation seldom affected by ice, as stream is spring fed.

DIVERSIONS.—Considerable water is diverted near Bly for irrigation.

REGULATION.—None.

ACCURACY.—Results apparently good after water-stage recorder was installed; fair prior to that time.

COOPERATION.—Field data furnished by United States Indian Service, H. N. Hincks, assistant engineer.

Discharge measurements of Sprague River near Yainax, Oreg., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Nov. 23	R. R. Randell	1.19	167	Apr. 16	J. W. Malin	5.12	880
Feb. 20	J. W. Malin	2.72	374	June 19	do	1.53	173
23	do	3.85	580	Aug. 4	do	1.10	140
Mar. 20	do	4.58	716	27	do	.84	119

Daily discharge, in second-feet, of Sprague River near Yainax, Oreg., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	.....	262	.....	.....	185	474	456	468	328	184	134	116
2	.....	.....	.....	.....	180	720	438	468	304	174	134	116
3	.....	.....	.....	922	175	698	420	488	289	169	138	116
4	248	.....	.....	.....	171	510	438	468	275	174	138	116
5	.....	.....	.....	.....	166	492	474	448	268	189	137	116
6	.....	.....	135	.....	162	570	590	428	268	174	136	115
7	.....	.....	.....	.....	157	632	654	410	289	164	136	115
8	.....	212	.....	.....	152	610	632	410	312	159	136	122
9	.....	.....	.....	.....	155	610	610	410	304	154	135	126
10	.....	.....	.....	212	158	610	654	410	282	150	134	126
11	180	.....	.....	.....	161	610	788	410	261	150	130	122
12	.....	.....	.....	.....	164	610	860	428	254	146	130	122
13	.....	.....	159	.....	167	632	788	448	240	142	128	126
14	.....	.....	.....	.....	170	676	742	448	234	142	126	126
15	.....	170	.....	.....	198	698	742	448	222	138	125	130
16	.....	.....	.....	.....	217	698	860	428	216	138	124	134
17	.....	.....	.....	.....	230	698	958	410	204	138	123	138
18	.....	.....	.....	180	244	698	866	392	194	138	121	138
19	.....	.....	.....	.....	262	698	808	392	174	142	121	138
20	.....	.....	156	.....	378	742	808	428	169	142	121	138
21	.....	.....	.....	.....	530	742	808	448	164	142	120	134
22	.....	.....	.....	.....	676	742	780	448	164	142	119	134
23	.....	170	.....	.....	550	764	752	448	159	138	119	134
24	.....	.....	.....	212	438	720	752	448	179	138	118	134
25	.....	.....	.....	.....	362	676	726	448	228	138	118	134
26	.....	.....	.....	.....	338	610	674	468	254	138	118	130
27	.....	.....	161	.....	346	570	624	468	222	134	119	130
28	.....	.....	.....	.....	346	530	576	428	210	134	119	130
29	.....	161	.....	.....	.....	492	532	392	204	134	119	130
30	.....	.....	.....	.....	.....	456	488	360	194	134	116	130
31	.....	.....	.....	190	.....	456	.....	336	.....	134	116	.....

NOTE.—Discharge determined from 3 rating curves, applicable Oct. 1 to Feb. 14 (well defined), Feb. 19 to Apr. 16 (fairly well defined), and Apr. 17 to Sept. 30 (well defined). Discharge interpolated Feb. 1-7, 9-13, and 15-18.

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nthly discharge of Sprague River near Yainax, Oreg., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
ovember			195	11,600	C.
ecember			153	9,410	C.
anuary			343	21,100	C.
ebruary	676	152	266	14,800	C.
arch	764	456	627	38,600	B.
pril	958	420	677	40,300	B.
ay	488	336	430	26,400	B.
une	328	159	236	14,000	B.
uly	189	134	149	9,160	B.
ugust	138	116	126	7,750	B.
eptember	138	115	127	7,560	B.
The period				190,000	

SPRAGUE RIVER AT CHILOQUIN, OREG.

OCATION.—In the NW. ¼ sec. 3, T. 35 S., R. 7 E., at Southern Pacific Co.'s railroad bridge 200 feet above the mouth, about three-fourths mile southwest of Chiloquin, Lake County.

RAINAGE AREA.—1,550 square miles.

ECORDS AVAILABLE.—July 25, 1911, to September 30, 1914.

AGE.—Chain gage on railroad bridge; read daily by employees of United States Indian Service.

ISCHARGE MEASUREMENTS.—Made from railroad bridge at gage; conditions not favorable; stream bed very rough.

HANNEL AND CONTROL.—Channel rocky and probably permanent; stage-discharge relation may be affected at times by backwater from Williamson River.

XTREMES OF DISCHARGE.—Maximum stage recorded during year, 3.70 feet at 8.30 a. m. March 19 (discharge, 3,030 second-feet); minimum stage recorded, 1.09 feet September 9 and 10 (discharge, 346 second-feet).

INTER FLOW.—Stage-discharge relation seldom affected by ice; not at all in 1913–14.

IVERSIONS.—Considerable water is diverted for irrigation in the headwaters of Sprague River. The Modoc Point canal, completed by the United States Indian Service in 1914, will divert water about a mile above the gage, but carried no water in 1914.

EGULATION.—None.

CCURACY.—Results apparently good. No great inaccuracy was introduced by backwater from Williamson River in 1914, as both streams rise and fall slowly and at about the same time, and frequent measurements were made. Records for earlier years not so good.

OOPERATION.—Field data furnished by United States Indian Service.

ischarge measurements of Sprague River at Chiloquin, Oreg., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
ov. 19	R. R. Randell	1.31	439	Mar. 17	J. W. Malin	3.40	2,660
26	do	1.31	432	Apr. 7	do	2.45	1,420
eb. 26	J. W. Malin	2.18	1,170	May 5	do	2.35	1,370
27	do	2.02	994	June 3	do	1.83	912
ar. 11	do	2.73	1,780	9	do	1.62	748
14	do	3.08	2,180	Sept. 2	Leach and Bostwick	1.11	358

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Daily discharge, in second-feet, of Sprague River at Chiloquin, Oreg., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	393	410	470	535	535	1,080	1,830	1,860	1,030	565	378	356
2	393	410	470	680	500	1,080	1,730	1,730	980	530	378	356
3	400	410	440	890	500	1,180	1,480	1,600	885	530	378	356
4	405	410	440	980	500	1,280	1,480	1,480	795	565	378	356
5	410	410	440	1,080	500	1,390	1,480	1,480	750	531	378	356
6	415	410	440	1,180	470	1,620	1,480	1,360	750	498	378	356
7	420	410	440	1,390	500	1,740	1,600	1,240	710	465	378	356
8	435	410	440	1,390	470	1,860	1,600	1,240	710	465	378	356
9	450	440	440	1,390	470	1,860	1,730	1,240	710	465	378	346
10	450	440	440	1,390	470	1,980	1,860	1,240	710	465	378	346
11	420	440	440	1,390	470	1,980	1,860	1,130	750	465	378	378
12	420	440	440	1,390	470	1,980	2,000	1,130	750	450	378	378
13	420	440	440	935	470	2,230	2,000	1,240	710	435	378	378
14	420	440	440	980	470	2,360	2,000	1,240	690	435	378	378
15	420	440	440	845	470	2,360	2,140	1,240	670	435	378	378
16	420	440	440	640	470	2,490	2,280	1,240	635	405	378	378
17	420	440	440	680	470	2,620	2,140	1,240	635	405	378	378
18	420	440	440	605	470	2,750	2,000	1,130	618	405	378	405
19	420	440	410	605	500	3,030	2,280	1,130	600	405	361	405
20	420	470	440	570	570	2,890	2,280	1,130	600	405	361	405
21	420	440	440	570	680	2,890	2,280	1,240	565	405	361	405
22	420	440	440	535	845	2,750	2,280	1,130	530	405	361	405
23	420	440	440	500	980	2,750	2,280	1,130	530	405	361	405
24	420	440	410	500	1,080	2,620	2,280	1,130	530	405	361	405
25	420	440	395	535	1,180	2,620	2,280	1,130	530	405	361	378
26	420	440	380	535	1,180	2,490	2,280	1,130	498	405	361	405
27	420	440	380	535	980	2,490	2,140	1,130	530	405	361	378
28	420	440	380	570	935	2,420	2,140	1,130	530	378	361	378
29	420	470	410	535	.....	2,140	2,000	1,130	565	378	361	378
30	420	470	440	605	.....	2,000	2,000	1,030	565	378	358	378
31	420	.....	470	570	.....	2,000	.....	1,030	.....	378	356	.....

NOTE.—Discharge determined from 3 fairly well defined rating curves, applicable Oct. 1-27, Nov. 5 to Mar. 27, and Mar. 28 to Sept. 30. Oct. 1, 3-6, and 8, and Oct. 28 to Nov. 4 interpolated, as discharge relation was affected by backwater from Williamson River.

Monthly discharge of Sprague River at Chiloquin, Oreg., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	450	393	419	25,800	B.
November	470	410	435	25,900	B.
December	470	380	433	26,600	B.
January	1,390	500	824	50,700	B.
February	1,180	470	629	34,900	B.
March	3,030	1,080	2,160	133,000	A.
April	2,280	1,480	1,970	117,000	A.
May	1,860	1,030	1,250	76,900	A.
June	1,030	498	669	39,800	B.
July	565	378	441	27,100	B.
August	378	356	371	22,800	B.
September	405	346	377	22,400	B.
The year	3,030	346	833	603,000	

SYCAN RIVER NEAR YAINAX, OREG.

LOCATION.—In the NW. ¼ sec. 28, T. 35 S., R. 12 E., about 6 miles above mouth of river, and about 16 miles northeast of Yainax, Klamath County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—November 25, 1911, to September 30, 1914.

GAGE.—Stevens water-stage recorder on left bank. J. L. Beatty, observer. A vertical staff gage in sec. 3, T. 36 S., R. 12 E., about 3 miles below present gage, was read 1911-13.

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DISCHARGE MEASUREMENTS.—Made from cable 15 feet above gage or by wading.

CHANNEL AND CONTROL.—Stream bed gravel and sand with heavy growth of weeds during summer; shifting; one channel at all stages; banks will not overflow.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 8.0 feet March 21 (discharge, 1,150 second feet; probably very close to the peak for the year); minimum gage height, 0.97 foot September 4–5 (discharge, 44 second-feet).

WINTER FLOW.—Stage-discharge relation apparently not seriously affected by ice, as most of low-water flow comes from springs.

DIVERSIONS.—Some water is used for irrigation of wild hay lands in Sycan marsh.

REGULATION.—None.

ACCURACY.—Results apparently good since recorder was installed.

COOPERATION.—Field data furnished by United States Indian Service.

Discharge measurements of Sycan River near Yainax, Oreg., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Nov. 22	R. R. Randell		70.4	Mar. 21	J. W. Malin	8.00	1,150
24	do		35.5	Apr. 16	do	6.69	899
Feb. 21	J. W. Malin	0.84	55.0	June 19	do	2.00	117
23	do	.90	65.6	Aug. 27	do	1.00	45.1

Daily discharge, in second-feet, of Sycan River near Yainax, Oreg., for the year ending Sept. 30, 1914.

Day.	Apr.	May.	June.	July.	Aug.	Sept.	Day.	Apr.	May.	June.	July.	Aug.	Sept.
1	.....	402	223	122	56	45	16	890	384	132	72	51	49
2	.....	384	210	111	56	45	17	870	420	127	72	51	51
3	.....	375	192	104	55	44	18	770	384	122	72	51	52
4	.....	358	192	102	55	44	19	710	375	117	71	50	51
5	.....	375	223	98	55	43	20	672	342	112	68	50	50
6	.....	358	223	95	55	45	21	750	302	109	66	49	50
7	.....	342	210	92	55	45	22	750	302	105	66	49	52
8	.....	326	198	92	55	45	23	710	326	102	65	48	51
9	.....	358	174	91	55	45	24	730	402	106	63	48	50
10	.....	384	162	87	54	45	25	654	474	117	61	47	50
11	.....	384	152	85	54	45	26	546	420	122	61	46	49
12	.....	366	147	82	53	45	27	474	366	127	61	45	48
13	.....	342	145	78	52	46	28	420	310	132	61	45	46
14	.....	326	144	77	52	46	29	384	272	132	60	45	45
15	.....	334	142	75	52	48	30	384	244	127	58	45	45
							31	.....	230	.....	57	45	.....

NOTE.—Discharge determined from rating curve well defined except for September, when stage-discharge relation may have been affected by aquatic plants.

Monthly discharge of Sycan River near Yainax, Oreg., for the year ending Sept. 30, 1914.

Month.	Discharge in second feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
April 16–30	890	384	648	19,300	A.
May	474	230	354	21,800	A.
June	223	102	151	8,980	A.
July	122	57	78.2	4,810	A.
August	56	45	50.9	3,130	A.
September	52	43	47.2	2,810	B.
The period	.....	.....	.....	60,800	

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WOOD RIVER AT FORT KLAMATH, OREG.

LOCATION.—In sec. 22, T. 33 S., R. 7½ E., at a highway bridge one-fourth mile north of Fort Klamath.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 5, 1911, to September 30, 1914.

GAGE.—Vertical staff attached to bridge; read daily by Gus Page.

DISCHARGE MEASUREMENTS.—Made from highway bridge.

CHANNEL AND CONTROL.—Clean gravel, overlain with pumice sand, dunes of which may at times be observed moving downstream; likely to shift.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 2.30 feet April 5 and 6 (discharge, 445 second-feet); minimum stage recorded, 1.50 feet February 10 to 14, 18 to 19 (discharge, 270 second-feet). The stage and discharge were probably both lower in September, but the record of stage is not regarded as reliable.

WINTER FLOW.—Stage-discharge relation unaffected by ice, as most of the water comes from copious springs a few miles above.

DIVERSIONS.—None.

REGULATION.—None.

ACCURACY.—Results only fair on account of unstable channel and lack of sufficient measurements. Discharge has been computed for all gage readings except December 1, 1911, to March 31, 1913, during which period there were no measurements and the rating curves for other periods evidently do not apply.

COOPERATION.—Gage-height record furnished by United States Reclamation Service.

Discharge measurements of Wood River at Fort Klamath, Oreg., during the year ending Sept. 30, 1914.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
		Feet.	*Sec.-ft.*			*Feet.*	*Sec.-ft.*
Mar. 13	J. W. Malin	1.84	321	May 20	J. W. Malin	1.95	369
Apr. 8	do	2.00	374				

Daily discharge, in second-feet, of Wood River at Fort Klamath, Oreg., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.
1	285	310	310	310	292	310	395	358	345	345
2	285	320	300	310	292	320	408	358	345	345
3	285	310	300	320	285	320	408	358	345	345
4	285	320	292	320	285	320	420	358	345	345
5	285	320	285	320	285	320	445	345	345	345
6	292	310	285	320	278	310	445	345	345	285
7	292	310	285	320	278	310	420	345	370	285
8	285	310	285	320	278	320	395	332	370	285
9	285	300	292	320	278	320	370	332	370	285
10	285	320	292	320	270	332	370	332	345	285
11	278	310	292	320	270	320	382	332	345	285
12	292	300	300	310	270	332	395	320	345	285
13	300	310	300	310	270	332	395	320	345	285
14	300	300	300	320	270	332	370	332	345	285
15	292	300	300	320	278	332	370	332	345	285
16	292	300	300	320	278	332	370	332	345	285
17	285	310	300	320	278	345	345	332	345	285
18	285	310	300	310	270	345	345	332	345	285
19	285	310	310	310	270	358	320	345	345	285
20	292	310	310	310	278	370	320	345	345	285
21	292	310	310	310	278	370	320	358	345	285
22	300	300	310	300	285	345	310	358	345	285
23	300	310	300	300	292	345	310	358	345	285
24	300	310	300	300	292	345	320	358	345	285
25	300	310	300	300	292	332	320	332	320	285
26	300	300	300	310	300	320	320	320	320	285
27	310	300	300	310	300	320	320	320	320	285
28	300	300	300	310	310	320	320	332	345	285
29	310	310	300	300	.....	345	332	332	345	285
30	310	310	300	300	.....	370	332	332	345	285
31	310	.....	300	300	.....	370	.....	345	.....	285

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Monthly discharge of Wood River at Fort Klamath Oreg., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	310	278	293	18,000	C.
November	320	300	308	18,300	C.
December	310	285	299	18,400	C.
January	320	300	312	19,200	C.
February	310	270	282	15,700	C.
March	370	310	334	20,500	B.
April	445	310	363	21,600	B.
May	358	320	340	20,900	B.
June	370	320	345	20,500	B.
July	345	285	295	18,100	C.
August	.....	.....	[a] 280	17,200	C.
September	.....	.....	[a] 275	16,400	C.
The year	445	.....	311	225,000	

[a] Estimated.

FOUR MILE CREEK NEAR ODESSA, OREG.

LOCATION.—In the NW. ¼ sec. 9, T. 36 S., R. 5 E., just below the outlet of Four Mile Lake, about 15 miles northwest of Odessa, Klamath County.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—April 6, 1912, to September 30, 1914.

GAGE.—Barrett and Lawrence water-stage recorder about 500 feet below outlet of lake on and after October 18, 1912. Vertical staff 10 feet below dam read April 6 to August 8, 1912. M. H. Wampler, observer.

DISCHARGE MEASUREMENTS.—Made from a footbridge near gage or by wading.

CHANNEL AND CONTROL.—Large, angular rocks; may shift slightly.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 1.85 feet May 22 and 27 (discharge, 56 second-feet); channel creek dry at times.

WINTER FLOW.—Stage-discharge relation may be affected by ice; records suspended during winter of 1914–15.

DIVERSIONS.—None.

REGULATION.—None; storage dam has never been operated.

ACCURACY.—Results, fair.

The following measurements was made by R. R. Randell:

November 15, 1913: Gage height, 1.42 feet; discharge, 3.6 second-feet.

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Daily discharge, in second-feet, of Four Mile Creek near Odessa, Oreg., for the year Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.	May.	June.	July.
1	0.0	0.6	7.6	.....	10	14	25	53	20
2	.1	.6	.....	.....	9.4	14	25	52	18
3	.1	.6	.....	.....	10	14	26	52	16
4	.2	.6	6.5	.....	10	13	26	51	14
5	.3	.6	.....	.....	10	13	27	51	12
6	.3	2.0	.....	.....	11	13	28	52	9.4
7	.4	3.4	.....	.....	11	13	28	52	9.0
8	.5	4.8	.....	.....	11	15	28	52	8.6
9	.5	6.2	6.5	.....	12	17	30	53	8.2
10	.6	7.6	.....	.....	12	19	33	53	8.0
11	.7	7.6	.....	.....	12	20	35	51	7.7
12	.7	7.6	.....	15	13	22	37	50	7.5
13	.8	7.6	.....	.....	13	24	40	48	7.2
14	.9	7.6	.....	.....	13	26	42	47	7.0
15	1.0	3.9	.....	.....	13	28	44	45	6.7
16	1.0	4.4	.....	.....	13	28	45	43	6.5
17	1.0	5.0	.....	.....	13	28	47	40	6.3
18	1.0	5.5	.....	.....	14	28	49	38	6.1
19	1.0	6.0	.....	.....	14	28	51	35	5.9
20	1.0	6.6	.....	.....	14	28	53	33	5.8
21	1.0	7.1	.....	.....	15	28	54	39	5.6
22	1.0	7.6	.....	.....	15	28	56	25	5.4
23	.9	7.6	.....	.....	15	28	56	21	5.2
24	.9	7.6	.....	.....	15	28	56	25	5.0
25	.8	7.6	.....	.....	15	28	56	25	4.3
26	.8	7.6	.....	.....	15	27	56	25	3.6
27	.7	7.6	.....	.....	15	27	56	24	3.0
28	.7	7.6	.....	.....	14	26	55	24	2.3
29	.6	7.6	.....	.....	14	26	55	24	1.6
30	.6	7.6	.....	.....	14	25	54	22	1.6
31	.6	.....	.....	.....	14	.....	53	.....	1.6

NOTE.—Discharge determined from a fairly well defined rating curve. Gage read about once discharge interpolated for days on which gage was not read.

Monthly discharge of Four Mile Creek near Odessa, Oreg., for the year ending Sept. 3(

Month.	Discharge in second-feet.			Run-off (Total in acre-feet)
	Maximum.	Minimum.	Mean.	
October	1.0	0.0	0.67	4
November	7.6	.6	5.48	32
December	.....	.....	a 4.0	24
January	.....	.....	a 4.0	24
Febraury	.....	.....	a 10.0	55
March	15	9.4	12.9	79
April	28	13	22.5	1,34
May	56	25	42.8	2,63
June	53	22	39.8	2,37
July	20	1.6	7.39	45
August	.....	.....	a 1.0	6
September	.....	.....	0	
The year	56	0	12.5	9,06

a Estimated.

"A" CANAL[1] AT KLAMATH FALLS, OREG.

LOCATION.—In the NW. ¼ sec. 29, T. 38 S., R. 9 E., about one-fourth mile bel headgates of the canal, at the head of a tunnel about a mile northwest of K Falls, Klamath County.

RECORDS AVAILABLE.—1911–1914 irrigation season. Some water was diver *three or* four years prior to 1911 but no record was kept.

[1] Published as Klamath main canal in Water-Supply Paper 331, p. 371.

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E.—Barrett and Lawrence water-stage recorder on right of canal just above weir.
HARGE MEASUREMENTS.—Made from a foot-plank just inside lower end of tunnel, about one-half mile below gage; rectangular section, 13.5 feet wide.
NNEL AND CONTROL.—Trapezoidal weir, 18.15 feet long, with its crest 7.27 feet above the bottom of canal, which is a concrete-lined section 13.5 feet wide on the bottom, 12 feet deep, with side slopes ½ to 1.
EMES OF DISCHARGE.—Maximum stage recorded during year, 3.30 feet June 22 (discharge, 375 second-feet); minimum discharge, zero.
RACY.—Current meter measurements made in 1915, check the weir formula, corrected for velocity of approach, up to a depth over weir of 1.75 feet, but shows per cent more water for a depth of 2.0 feet and 6 per cent more for a depth of 3 eet. Too few sections were used in making earlier measurements, which have herefore been discarded. Results for 1913 and 1914 apparently excellent.
ERATION.—Data furnished by United States Reclamation Service.

" canal diverts from Link River immediately below the outlet of Upper Klamath , in the NE. ¼ sec. 30, T. 38 S., R. 9 E.; water is used to irrigate lands lying east lamath River and both sides of Lost River. Most of the return water reaches River. (See p. 302.)

discharge, in second-feet, of "A" canal at Klamath Falls, Oreg., for the years ending Sept. 30, 1913–14.

.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept.
						1914.					
...	28	262	42	9	54	1.....	16	217	102	270	69
...	86	286	42	30	46	2.....	52	217	98	232	58
...	81	294	38	58	42	3.....	58	220	119	202	58
...	76	294	34	67	46	4.....	56	220	96	187	58
...	42	310	27	144	54	5.....	58	202	104	187	58
...	50	294	14	144	50	6.....	121	202	115	175	58
...	62	294	38	151	58	7.....	107	180	154	158	58
...	76	254	81	187	54	8.....	86	158	210	158	58
...	91	187	96	187	42	9.....	76	138	144	117	58
...	102	172	138	210	46	10.....	107	125	232	119	58
...	102	180	172	194	86	11.....	141	125	240	144	76
...	102	194	158	144	72	12.....	144	119	235	131	76
...	102	151	119	138	34	13.....	172	86	247	125	65
...	91	86	125	96	34	14.....	187	86	247	147	58
...	76	107	194	81	34	15.....	217	96	262	131	43
...	107	144	202	107	58	16.....	232	158	267	121	27
...	131	217	194	144	42	17.....	235	214	247	120	5
...	131	254	180	76	27	18.....	158	262	254	119	5
...	138	270	172	58	17	19.....	247	318	294	119	2
...	144	270	180	119	34	20.....	262	358	294	119	2
...	144	254	194	113	38	21.....	278	355	297	113	2
...	144	224	247	107	42	22.....	262	375	334	107	34
...	172	240	254	107	46	23.....	238	286	310	96	27
...	165	254	86	107	34	24.....	217	144	270	91	14
...	202	262	34	113	14	25.....	232	50	310	81	14
...	202	262	34	96	0	26.....	247	27	326	86	14
...	232	0	9	96	0	27.....	240	34	302	96	14
...	247	86	9	119	0	28.....	217	34	310	96	27
...	247	72	9	107	0	29.....	217	34	318	91	42
...	262	62	9	76	0	30.....	224	34	310	86	27
...	262	.....	9	58	.....	31.....	217	.....	294	78	.....

E.—Discharge determined from a well-defined rating curve.

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Monthly discharge of "A" canal at Klamath Falls, Oreg., for the years ending Sept. 30, 1913–14.

Month.	Discharge in second feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1913.					
May	262	28	132	8,120	A.
June	310	0	208	12,400	A.
July	254	9	101	6,210	A.
August	210	9	111	6,820	A.
September	86	0	36.8	2,190	A.
The period				35,700	
1914.					
May	278	16	172	10,600	A.
June	375	27	169	10,100	A.
July	334	96	237	14,600	A.
August	270	78	132	8,120	A.
September	76	2	38.8	2,310	A.
The period				45,700	

LOST RIVER AT WILSON BRIDGE, NEAR OLENE, OREG.

LOCATION.—In the NW. ¼ sec. 32, T. 39 S., R. 10 E. at Wilson Bridge, about one-fourth mile below the diversion dam and about 4 miles by river below Olene, Klamath County.

RECORDS AVAILABLE.—March 14, 1912, to September 30, 1914.

DRAINAGE AREA.—Not measured.

GAGE.—Vertical staff attached to highway bridge; datum, 4005.18 feet above sea level and 60 feet below datum used in 1912. Gage read daily, when water is flowing, by the watchman for the dam.

DISCHARGE MEASUREMENTS.—Made from highway bridge or by wading.

CHANNEL AND CONTROL.—Gravel and sand; control of boulders, fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during 1914, 68.5 feet March 10 (discharge, 1,630 second-feet); channel dry except when total discharge exceeds capacity of diversion channel.

WINTER FLOW.—Stage-discharge relation not affected by ice.

DIVERSIONS.—This station is just below the dam at which practically all the discharge of Lost River, up to about 500 second-feet, is diverted through the diversion canal[1] into Klamath River or into the Griffith lateral on the east bank of the river.

REGULATION.—Changes in discharge covering several days may be caused at times by the operation of the movable crest and outlet gates of the dam.

ACCURACY.—Results good.

COOPERATION.—Field data furnished by United States Reclamation Service.

[1] See p. 306.

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Discharge measurements of Lost River at Wilson Bridge, near Olene, Oreg., during the years ending Sept. 30, 1912–1914.

[Made by Leland Mosier.]

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
1912.	*Feet.*	*Sec.-ft.*	1913.	*Feet.*	*Sec.-ft.*
June 3	.....	5.8	Apr. 7	63.40	554
July 10	.....	35.8	12	68.25	1,640
10	61.52	264	14	68.00	1,460
1913.			16	65.20	903
Apr. 2	66.30	1,050	1914.		
4	64.30	617	Jan. 5	63.92	584

Daily discharge, in second-feet, of Lost River at Wilson Bridge, near Olene, Oreg., for 1912–1914.

Day.	1912			1913		1914						
	May.	July.	Oct.	Mar.	Apr.	Jan.	Feb.	Mar.	Apr.	July.	Aug.	Sept.
1	340	.....	.....	.....	.....	.....	.....	.....	.....	.....	86	86
2	459	.....	.....	.....	1,110	.....	.....	358	.....	.....	86	86
3	637	.....	.....	.....	1,270	.....	.....	1,040	.....	.....	86	81
4	789	.....	.....	.....	1,040	504	.....	930	.....	.....	86	81
5	573	.....	.....	.....	1,040	576	.....	870	.....	23	83	76
6	312	.....	.....	.....	952	870	.....	870	.....	118	82	76
7	210	.....	.....	.....	730	1,110	.....	1,270	.....	118	82	76
8	121	406	.....	.....	750	1,390	.....	1,390	.....	116	94	76
9	69	406	.....	.....	810	770	.....	1,630	.....	108	94	76
10	34	106	.....	.....	910	296	.....	1,510	.....	104	90	76
11	30	226	.....	a 200	1,200	106	.....	1,390	200	104	76	76
12	28	212	.....	a 100	1,510	86	.....	1,270	328	98	60	76
13	25	164	296	.....	1,650	.....	.....	1,220	282	92	46	76
14	20	140	296	.....	1,410	.....	.....	1,220	140	92	51	71
15	.....	140	296	.....	1,150	.....	.....	1,040	116	92	56	71
16	.....	96	296	.....	830	.....	.....	1,020	128	86	56	71
17	.....	96	226	.....	850	.....	.....	930	374	91	60	76
18	.....	91	226	.....	630	.....	.....	830	261	87	69	86
19	.....	86	164	.....	486	.....	.....	710	140	88	75	106
20	.....	86	164	.....	454	.....	.....	710	.....	88	74	116
21	.....	56	0	.....	374	.....	.....	630	.....	85	66	106
22	.....	56	.....	.....	310	.....	164	522	.....	86	60	62
23	.....	76	.....	.....	226	.....	690	522	.....	80	71	.....
24	.....	66	.....	.....	140	.....	630	454	.....	80	71	.....
25	.....	56	.....	.....	106	.....	296	454	.....	76	69	.....
26	.....	.....	.....	.....	106	116	164	268	.....	80	67	.....
27	.....	.....	.....	.....	.....	200	140	164	.....	88	66	.....
28	.....	.....	.....	.....	.....	106	106	140	.....	86	64	.....
29	.....	.....	.....	.....	.....	.....	.....	106	.....	86	66	.....
30	.....	.....	.....	.....	.....	.....	.....	86	.....	84	71	.....
31	.....	.....	.....	.....	.....	.....	.....	76	.....	80	79	.....

a Estimated.

NOTE.—Discharge determined from a fairly well defined rating curve. Discharge Mar. 11–12, 1913, estimated; mean discharge May 15–31, 1912, estimated at 15 second-feet.

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Monthly discharge of Lost River at Wilson Bridge, near Olene, Oreg., for the years end Sept. 30, 1912–1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Ac ra
	Maximum.	Minimum.	Mean.		
1911–12.					
October	112	107	108	6,640	A
November	112	107	110	6,550	A
December	112	109	109	6,700	A
January	810	109	302	18,600	A
February	2,790	540	809	45,600	A
March	572	143	328	20,200	B
April	280	100	192	11,400	B
May	789	.....	126	7,750	B
June	.....	.....	a 0.5	30	D
July	406	0	82.7	5,080	B
August	0	.....	.....	a 30	D
September	0	0	0	0	
The year	2,790	0	177	129,000	
1912–13.					
October	296	0	63.4	3,900	C.
November	0	0	0	0	
December	0	0	0	0	
January	0	0	0	0	
February	0	0	0	0	
March	200	0	9.7	596	D
April	1,650	0	668	39,700	B
May	0	0	0	0	
June	0	0	0	0	
July	0	0	0	0	
August	0	0	0	0	
September	0	0	0	0	
The year	1,650	0	61.1	44,200	
1913–14.					
October	0	0	.0	0	
November	0	0	.0	0	
December	0	0	.0	0	
January	1,390	0	198	12,200	B
February	690	0	78.2	4,340	C
March	1,630	0	762	46,900	B
April	374	0	65.6	3,900	C.
May	0	0	.0	0	
June	0	0	.0	0	
July	118	0	77.9	4,790	B.
August	94	46	72.3	4,450	B.
September	116	0	59.4	3,530	B.
The year	1,630	0	111	80,100	

a Estimated.

NOTE.—Estimate of discharge for May, 1912, supersedes that published in Water-Supply Pap No. 331, p. 385.

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discharge[a] of Lost River at Wilson Bridge, near Olene, Oreg., for the years ending Sept. 30, 1912–1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1911–12.					
	112	107	108	6,640	A.
	112	107	110	6,550	A.
	112	109	109	6,700	A.
	810	109	302	18,600	A.
	2,790	540	809	45,600	A.
	572	143	328	20,200	B.
	280	100	192	11,400	B.
	934	76	310	19,100	B.
	206	68	144	8,570	A.
	439	0	101	6,210	B.
	116	53	87.3	5,370	B.
	176	45	98.9	5,880	B.
year	2,790	0	222	161,000	
1912–13.					
	296	0	114	7,010	C.
	98	87	94.6	5,630	A.
	133	80	101	6,210	B.
	121	73	97.4	5,990	B.
	97	92	94.5	5,250	B.
	663	95	265	16,300	B.
	2,130	350	1,120	66,600	B.
	336	86	157	9,650	B.
	126	72	111	6,600	A.
	167	94	123	7,560	A.
	152	72	120	7,380	A.
	141	95	110	6,550	A.
year	2,130	0	208	151,000	
1913–14.					
	117	68	102	6,220	B.
	120	63	100	5,950	A.
	260	102	107	6,580	A.
	1,360	154	606	37,300	C.
	1,120	50	326	18,100	C.
	2,090	462	1,210	74,400	B.
	830	323	458	27,300	C.
	298	0	164	10,100	B.
	158	91	117	6,960	A.
	128	99	115	7,070	B.
	96	61	88.7	5,450	B.
	122	71	95.0	5,650	B.
year	2,090	0	292	211,000	

[a] Includes flow in Lost River diversion canal and Griffith lateral. See pp. 306, 310.

MILLER CREEK NEAR LORELLA, OREG.

N.—In sec. 7, T. 40 S., R. 14 E., at the site of an old wagon bridge, about ⅘-fourths mile above the highway bridge 3 miles south of Lorella, Klamath nty, and 1 mile east of the Swingle ranch, in Langell Valley.

E AREA.—270 square miles.

S AVAILABLE.—April 1, 1909, to September 30, 1914. Records were kept ıst 10, 1904, to December, 1908, at a station in sec. 12, T. 39 S., R. 13 E., at ower end of Horsefly Valley and 10 miles or more by creek above the present on; only a small amount of inflow between the two points.

Friez water-stage recorder attached to old bridge abutment on left bank.

GE MEASUREMENTS.—Made from highway bridge or by wading; current ish at bridge, as gradient of stream is flat.

L AND CONTROL.—Stream bed rocks and gravel overlain with some silt; con- fairly permanent; left bank overflows in floods.

ES OF DISCHARGE.—Maximum stage during year from water-stage recorder, feet at 11 p. m. March 6 (discharge, 2,000 second-feet); minimum stage, 2.32 August 29 (channel probably dry).

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WINTER FLOW.—Stage-discharge relation apparently not materially affected by ice, as control remains open; open channel rating curve was formerly applied throughout the winter, but discharge has not been computed for low winter stages in 1913 or 1914.

DIVERSIONS.—A small irrigating flume, carrying about 1 second-foot, diverts water just above the present station; there is probably a considerable area irrigated above the station.

REGULATION.—Flow may be occasionally affected by a rock and brush diversion dam just above gage.

ACCURACY.—Results apparently good for higher stages, as the curve defined by measurements made in 1910–11 has been confirmed by measurements made in 1915–16; rating for low and medium stages is very uncertain and no estimates have been attempted except during the months of considerable run-off.

COOPERATION.—Field data furnished by United States Reclamation Service, Klamath project.

No measurements made during 1914.

Daily discharge, in second-feet, of Miller Creek near Lorella, Oreg., for the year ending Sept. 30, 1914.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1	7	7	1,190	107	25	3.6	16	38	3.2	940	540	1.5	2.5
2	184	8	1,000	94	13	3.4	17	15	1.5	850	334	6	2.3
3	280	10	745	164	9	3.1	18	13	2.5	810	127	6	1.7
4	649	12	770	202	6	2.9	19	12	11	810	78	4	1.4
5	1,220	14	1,190	485	4	2.7	20	12	44	760	56	3.7	1.0
6	1,120	16	1,610	320	2.5	2.5	21	9	362	626	48	2.5	1
7	970	17	1,260	197	2.3	5	22	5	378	626	38	2.3	1
8	500	15	1,410	147	2.3	5	23	5	293	626	48	2.5	1
9	338	13	1,370	164	1.7	5	24	7	202	393	190	2.5	1.5
10	177	11	1,220	850	1.4	6	25	22	177	301	107	3.7	3.2
11	154	10	1,190	582	1.2	5	26	24	197	233	93	6	1.9
12	131	8	1,330	277	.9	5	27	20	172	177	80	6	1
13	108	6	1,370	142	.5	4	28	17	306	122	67	6	1.1
14	84	4	1,160	112	.4	3.7	29	14	.....	81	53	5	1.5
15	61	3.2	1,030	520	.4	3.2	30	12	.....	81	40	4	1.4
							31	9	.....	72	.....	3.8	.....

NOTE.—Discharge determined from a well defined rating curve based on measurements made in 1915 and 1916. Interpolated Jan. 9, 11–16, 28–30, Feb. 2–6, 8–13, Apr. 17, 26–30, May 31 to June 5.

Monthly discharge of Miller Creek near Lorella, Oreg., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
January	1,220	5	201	12,400	B.
February	378	1.5	82.3	4,570	B.
March	1,610	72	818	50,300	B.
April	850	38	209	12,400	B.
May	27	.4	4.42	272	C.
June	6	1.0	2.79	166	D.
The period	.....	.....	.....	80,100	

NOTE.—Discharge, October to December and July to September, probably ranged from zero to about 13 second-feet on Nov. 19; total run-off for these months believed to have been between 400 and 600 acre-feet.

LOST RIVER DIVERSION CANAL NEAR OLENE, OREG.

LOCATION.—In the SW. ¼ sec. 29, T. 39 S., R. 10 E., at headgates of canal at Lost River dam, about 4 miles by river below Olene.

RECORDS AVAILABLE.—May 1, 1912, to September 30, 1914.

GAGE.—Vertical staffs, showing height of water in pond back of head gates and in canal below head gates; read daily or whenever gates are changed.

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GATE OPENINGS.—The headworks of the canal comprise three hand-operated sliding gates, each 4 feet wide and 6 feet high. The gate openings are recorded each day and for each period of less than a day when the gates are changed. Water from Klamath River backs up in the canal nearly to its head, even if no water is flowing in the canal.

DISCHARGE MEASUREMENTS.—Made from a footbridge a short distance below the head gate.

DISCHARGE COEFFICIENTS.—The coefficients for computing the flow through the gates considered as orifices have been derived by plotting the coefficients determined from measurements in three groups—for gate openings 1.5 to 2.0 feet, 2.5 to 3.5 feet, and 4.0 to 5.5 feet. The gates are opened an even half foot, and seldom less than 1.5 feet. The coefficient has been plotted as a coordinate with head on gates. The coefficients used vary from 0.80 to 0.93 for heads over 1.00 foot, but for low heads exceed 1.00.

EXTREMES OF DISCHARGE.—Maximum observed discharge during 1914, 508 second-feet for gate opening on all three gates of 5.5 feet and a head of 0.85 foot; minimum discharge, zero.

ACCURACY.—Results apparently good except for heads of less than 1.0 foot with low gate openings and for heads of less than 0.5 foot with the higher gate openings. For these conditions the coefficients are not determined closely and the practice of reading the heads only to the nearest half-tenth foot introduces some uncertainty.

COOPERATION.—Field data furnished by the United States Reclamation Service; results computed by engineers of the United States Geological Survey.

The canal diverts water from Lost River into Klamath River, in order to assist in lowering Tule Lake, for the purpose of reclaiming the lake bed. (See p. 302.)

Discharge measurements of Lost River diversion canal near Olene, Oreg.

Gate openings 1.5 to 2.0 feet.

Date.	Head on gates.	Gates open.		Discharge.	Coefficient of discharge.
		Number.	Distance.		
1913.			*Feet.*		
Oct. 9	1.06	2	1.95	102	0.77
10	1.03	2	1.95	104	.82
15	1.32	2	2.00	123	.84
16	1.19	2	2.00	111	.80
Nov. 13	2.05	2	1.50	107	.78
13	2.06	2	1.50	110	.80

Gate openings 2.5 to 3.5 feet.

1912.					
May 31	2.85	1	2.50	124	0.91
June 1	2.66	1	3.00	143	.91
1	2.53	1	3.50	160	.90
3	2.92	1	2.50	125	.92
3	2.77	1	3.00	140	.88
4	2.53	1	3.50	158	.88
8	2.93	1	2.50	122	.89
8	2.76	1	3.00	145	.90
10	2.10	1	3.50	146	.90
1913.					
Nov. 17	2.02	1	2.50	106	.93
Dec. 3	2.05	1	2.50	108	.94
1914.					
Jan. 2	1.15	3	3.00	262	.84
May 2	.45	2	3.00	239	.91
		1	3.50		
5	.75	2	2.50	192	.82
		1	3.50		

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Discharge measurements of Lost River diversion canal near Olene, Oreg.—Continu

Gate openings 4.0 feet and over.

Date.	Head-on gates.	Gates open.		Dis-charge.	Coe cie of d char
		Num-ber.	Dis-tance.		
1912.			*Feet.*		
June 10	1.95	1	4.00	164	(
10	2.00	1	4.00	171	
11	2.05	1	4.00	173	
1913.					
Mar. 11	.85	3	5.00	464	1
11	.80	3	5.00	442	1
12	.80	3	5.16	462	1
14	.74	3	5.16	437	1
17	.30	3	5.16	322	1
17	.25	3	5.16	329	1
20	1.10	2	4.00	248	
20	1.10	2	4.00	239	
24	.75	2	4.00	227	1
Apr. 2	.90	3	5.00	467	1
14	.90	3	5.16	460	
16	1.00	3	5.16	445	
1914.					
Jan. 6	1.13	3	4.50	425	
7	1.00	3	5.00	474	

Made before gate openings were recorded.

Date.	Gage height.	Dis-charg
1912.		
May 3	3.51	
4	4.10	
6	4.60	
7	4.59	
8	4.81	
9	5.15	
10	5.10	
11	5.00	
16	4.35	

Daily discharge, in second-feet, of Lost River diversion canal near Olene, Oreg., for t years ending Sept. 30, 1912–1914.

Day.	May.	June.	July.	Aug.	Sept.	Day.	May.	June.	July.	Aug.	Sept
1912.						1912.					
1	40	139	155	77	91	16	248	142	.....	91	
2	60	120	113	94	91	17	202	136	.....	99	
3	130	133	40	101	94	18	180	118	.....	78	
4	145	117	62	115	94	19	87	134	.....	87	
5	200	124	23	101	94	20	83	153	.....	88	
6	278	205	37	94	97	21	61	153	.....	88	
7	353	124	35	87	97	22	62	153	.....	88	
8	390	130	30	93	125	23	106	145	.....	88	
9	345	173	.....	94	125	24	137	158	.....	88	
10	345	67	.....	90	133	25	139	158	.....	88	
11	277	150	.....	67	117	26	146	158	.....	88	
12	239	136	.....	53	162	27	149	177	.....	88	
13	260	130	.....	59	98	28	144	188	.....	88	
14	244	128	.....	70	176	29	144	176	.....	88	
15	218	130	.....	80	155	30	144	125	.....	91	
						31	150	.....	14	91	.....

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discharge, in second-feet, of Lost River diversion canal near Olene, Oreg., for the years ending Sept. 30, 1912–1914—Continued.

ay.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
2–13.												
.....	85	91	98	105	97	95	480	336	122	126	147	113
.....	85	89	98	105	97	95	372	252	122	126	147	97
.....	87	87	98	105	97	95	409	256	125	126	144	97
.....	89	87	98	105	97	95	468	256	125	126	138	97
.....	91	87	101	105	97	100	472	250	125	126	134	103
.....	87	91	101	105	92	102	472	243	80	126	130	106
.....	87	94	101	105	92	139	480	146	72	126	126	106
.....	87	97	101	105	92	154	479	157	96	103	122	106
.....	87	97	101	105	94	338	470	199	96	95	117	106
.....	88	94	111	105	94	365	470	168	99	97	70	106
.....	92	92	125	105	94	463	482	160	99	97	67	106
.....	273	92	125	105	94	486	448	154	99	97	70	106
.....	.....	92	125	105	94	477	484	148	99	97	72	106
.....	.....	94	118	121	94	471	468	148	99	73	57	108
.....	.....	96	116	80	94	453	456	143	99	70	100	110
.....	.....	96	113	73	94	341	480	86	99	70	120	138
.....	.....	97	113	79	94	332	492	88	117	70	116	141
.....	.....	97	133	89	94	335	456	94	117	99	87	138
.....	.....	98	98	89	94	259	448	99	117	101	78	130
.....	.....	97	90	94	94	262	448	105	117	103	87	126
.....	.....	98	90	94	94	262	448	128	117	126	90	106
.....	.....	98	90	94	94	246	459	150	117	122	90	95
.....	.....	97	90	92	94	250	448	114	117	167	90	95
.....	.....	98	90	92	95	237	448	122	117	166	114	95
.....	.....	98	88	92	95	239	448	126	117	134	126	95
.....	.....	97	85	94	95	234	448	126	122	152	117	110
.....	.....	97	85	94	95	159	448	125	122	144	124	117
.....	67	96	85	94	95	160	400	125	126	144	134	117
.....	87	97	80	94	.....	174	375	122	126	147	146	117
.....	83	98	85	94	.....	248	350	122	126	147	152	117
.....	89	.....	100	94	.....	253	.....	122	.....	147	152	.....
3–14.												
.....	112	88	102	154	50	462	347	298	115	114	.....	.....
.....	109	101	102	301	50	482	347	252	118	110	.....	.....
.....	107	101	102	400	50	480	347	234	113	102	.....	.....
.....	106	101	102	379	50	438	347	211	110	99	.....	.....
.....	102	101	103	406	50	438	347	204	110	77	.....	.....
.....	101	101	103	443	74	456	392	187	110	.....	.....	.....
.....	99	63	104	454	74	468	430	165	105	.....	.....	.....
.....	98	74	104	468	71	480	420	160	100	.....	1	.....
.....	96	76	104	480	276	456	462	152	100	.....	2	.....
.....	94	112	104	471	366	480	468	152	98	.....	6	.....
.....	93	120	104	482	244	438	456	152	91	.....	9	.....
.....	90	109	102	475	222	438	456	152	97	.....	11	.....
.....	85	109	102	462	222	438	462	0	90	.....	15	.....
.....	68	109	102	409	240	438	442	91	90	.....	14	.....
.....	112	100	102	409	231	438	423	162	90	.....	8	.....
.....	112	104	102	423	231	438	433	198	90	.....	6	.....
.....	115	104	102	409	222	438	456	198	90	.....	6	.....
.....	117	104	102	402	231	432	420	218	84	.....	3	.....
.....	112	103	102	420	264	456	408	231	72	.....	.....	.....
.....	107	103	102	402	363	456	394	168	73	.....	.....	.....
.....	106	103	102	402	352	456	344	129	75	.....	6	.....
.....	106	103	102	402	410	456	395	129	75	.....	6	38
.....	106	102	102	330	432	456	370	129	65	.....	.....	95
.....	102	102	102	330	394	444	362	129	70	.....	.....	122
.....	102	102	102	330	422	444	346	129	135	.....	.....	121
.....	102	102	102	438	423	438	346	127	136	.....	.....	119
.....	101	102	102	466	323	438	346	90	122	.....	.....	117
.....	101	102	102	442	508	444	362	85	118	.....	.....	116
.....	101	102	102	442	.....	438	330	86	118	.....	.....	115
.....	101	102	102	409	.....	438	323	90	117	.....	.....	115
.....	101	.....	260	409	.....	420	.....	109	.....	.....	.....	.....

.—Discharge computed from records of gate opening, head on gates, and coefficients of discharge l from current-meter measurements.

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DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Boulders and gravel; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 14.0 feet at 10 a. m. December 31 (discharge, 32,600 second-feet); minimum stage recorded, 3.60 feet October 1 to 5 and most of September (discharge, 255 second-feet; record fragmentary).

1911–1914: Maximum stage recorded, 14.1 feet at 3.30 p. m. February 17, 1912 (discharge, 33,000 second-feet); minimum stage recorded, 3.5 feet September 20 to 25, October 6 to 8, and November 3 to 7, 1911 (discharge, 180 second-feet).

ACCURACY.—Rating curve fairly well defined for low and medium stages; results fair; estimates for high water are approximate.

COOPERATION.—Gage-height record furnished by W. H. Hotelling.

The following discharge measurement was made by Carl Langford:

March 16, 1914: Gage height, 660 feet; discharge, 4,980 second-feet.

Daily discharge, in second-feet, of Salmon River at Somesbar, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	255	335	433	11,700	.....	.....	4,450	2,850	.....	.....	.....	.....
2	255	330	427	24,400	.....	.....	.....	.....	.....	.....	.....	.....
3	255	330	421	9,310	.....	.....	.....	.....	3,270	.....	385	.....
4	255	335	421	11,400	.....	.....	.....	.....	.....	.....	.....	.....
5	255	3,720	421	8,320	3,960	4,450	.....	4,450	.....	1,620	.....	.....
6	335	8,650	421	7,680	.....	.....	.....	.....	.....	.....	.....	.....
7	385	3,270	445	7,050	.....	.....	.....	.....	3,270	.....	.....	.....
8	421	750	445	6,430	.....	.....	3,270	.....	.....	.....	.....	.....
9	433	750	385	.....	5,830	.....	3,490	.....	.....	.....	.....	.....
10	433	750	385	.....	.....	4,980	8,000	.....	3,060	1,020	.....	.....
11	433	580	335	.....	.....	.....	.....	4,450	.....	.....	.....	.....
12	385	580	335	.....	.....	.....	5,830	.....	.....	.....	.....	.....
13	385	580	345	.....	.....	.....	7,360	.....	2,960	.....	.....	.....
14	385	510	345	.....	5,260	.....	8,980	4,710	.....	850	.....	.....
15	385	445	445	6,430	.....	.....	10,700	.....	2,850	.....	360	.....
16	385	445	445	5,540	.....	.....	.....	.....	.....	.....	.....	.....
17	360	445	445	4,710	.....	.....	.....	.....	2,850	.....	.....	255
18	360	445	445	3,720	.....	.....	.....	.....	.....	.....	.....	.....
19	360	445	445	3,720	4,450	.....	.....	.....	.....	.....	.....	.....
20	360	385	445	3,060	.....	5,260	3,270	.....	2,650	705	.....	.....
21	360	445	445	12,100	.....	.....	.....	.....	.....	.....	.....	.....
22	360	445	960	19,100	.....	.....	.....	5,540	.....	.....	.....	.....
23	360	445	1,200	.....	.....	.....	.....	.....	.....	.....	.....	.....
24	360	445	1,200	.....	4,450	.....	.....	.....	5,540	.....	.....	.....
25	360	445	1,470	10,300	.....	.....	.....	.....	.....	.....	258	.....
26	335	433	1,470	.....	.....	.....	.....	.....	.....	.....	.....	.....
27	335	433	1,200	.....	.....	.....	.....	.....	4,980	.....	.....	.....
28	335	433	1,080	6,740	4,200	.....	.....	.....	.....	445	.....	.....
29	335	427	1,080	.....	.....	.....	.....	.....	3,490	.....	.....	.....
30	335	427	1,080	4,710	.....	.....	2,850	3,720	.....	.....	.....	255
31	335	.....	32,600	4,450	.....	2,460	.....	.....	.....	445	.....	.....

NOTE.—Discharge determined from a rating curve well defined below 8,000 second-feet.

Monthly discharge of Salmon River at Somesbar, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	433	255	351	21,600	B.
November	8,650	330	949	56,500	B.
December	32,600	335	1,680	103,000	C.
The period	.....	.....	.....	181,000	

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e measurements of Griffith lateral near Olene, Oreg., during the years ending Sept. 30, 1913–14.

Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
	Feet.	*Sec.-ft.*	1914.		*Feet.*	*Sec.-ft.*
Leland Mosier	89.74	23.8	May 27	C. E. Maxwell	89.90	23.4
			30	do	90.35	32.7
C. E. Maxwell	89.70	20.2	June 10	do	89.35	15.7

scharge, in second-feet, of Griffith lateral near Olene, Oreg., for the years ending Sept. 30, 1912–1914.

Day.	1912	1913		1914				
	July.	July.	Aug.	May.	June.	July.	Aug.	Sept.
	8				22	6	17	
	8				14	8	15	
	10				14	8	15	12
	10				16	8	15	12
	5				13	8	15	9
	5				13	10	16	
	5				13	9	13	
	3				13	12	0	
					14	18	0	6
			7		17	24	0	12
			8		20	24	8	12
			10		19	26	17	12
			11		23	27	22	12
		24	15		22	27	26	9
		24	17		21	28	25	9
		24	17		20	25	23	5
		24	17		19	27	20	
		26	16		18	29	15	
		26	16		19	29	13	
		26	17	19	22	29	13	
			20	19	24	29	13	
			20	19	26	29	13	
			20	20	28	29	13	
			20	20	28	29	13	
			22	20	23	29	13	
				19	18	29	13	
				24	10	24	15	
				27	6	19	15	
				30	6	22	13	
				25	8	21	7	
				20		19	0	

Discharge for July and August, 1913, based on fairly well defined rating curve; for other periods ıted by the United States Reclamation Service from orifice data and is somewhat uncertain.

discharge of Griffith lateral near Olene, Oreg., for the years ending Sept. 30, 1912–1914.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
1912.					
	10	0	1.7	105	
1913.					
	26	0	5.6	344	B.
	22	0	8.2	504	B.
1914.					
	30	0	8.5	523	
	28	6	17.6	1,050	
	29	6	21.3	1,310	
	26	0	13.4	824	
	12	0	3.7	220	
period				3,930	

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EAST FORK OF SCOTT RIVER AT CALLAHAN, CAL.

LOCATION.—In the SW. ¼ SW. ¼ sec. 16, T. 40 N., R. 8 W., at highway bridge at Callahan, in Shasta National Forest, about 800 feet above junction with South Fork.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—October 6, 1913, to September 30, 1914 (fragmentary).

GAGE.—Staff in two sections on left bank; lower section, inclined, fastened to cottonwood tree about 10 feet above bridge; upper section, vertical, fastened to left abutment of bridge. Observers, Forest Ferguson and F. H. Williams.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Boulders and small gravel.

EXTREMES OF STAGE.—Maximum stage recorded during year, 7.45 feet at 4 p. m. April 11; minimum stage recorded, 5.15 feet August 22, September 3, 8, and 14; the stage was probably 5.15 feet between those dates also (record fragmentary).

COOPERATION.—Station maintained in cooperation with United States Forest Service.

Estimates of discharge withheld until additional discharge measurements can be made.

Discharge measurements of East Fork of Scott River at Callahan, Cal., during the years ending Sept. 30, 1913–14.

Date.	Made by—	Gage height.	Discharge.	Date.	Made by—	Gage height.	Discharge.
1913. Sept. 9	Lasley Lee	*Feet.* 5.13	*Sec.-ft.* 8.2	1914. June 26	H. J. Tompkins	*Feet.* 6.10	*Sec.-ft.* 132

Daily gage height, in feet, of East Fork of Scott River at Callahan, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Apr.	May.	June.	July.	Aug.	Sept.
1		5.30				6.95			
2		5.30	5.42		6.78			5.3	
3		5.20							5.15
4									
5			5.47		6.92			5.3	
6	5.20						6.0	5.3	
7	5.20						6.0		
8	5.20	5.30	5.48	7.40			5.95		5.15
9				7.45	6.87	6.15	5.9	5.25	
10	5.20					6.2	5.85		
11	5.20	5.30		7.45	6.85	6.2		5.25	
12	5.20		5.70			6.3			
13	5.20		5.75		7.10	6.3		5.2	
14	5.20					6.3	5.7		5.15
15	5.20	5.35		7.35	7.18	6.4			
16	5.20		5.80		7.12	6.45			
17	5.20			6.85		6.5			5.3
18		5.45			7.05	6.5	5.6		
19						6.5		5.2	
20				7.42	7.15	6.5	5.7	5.2	
21		5.52				6.35			
22				6.82		6.3		5.15	
23		5.50		6.57	7.00	6.1			
24						6.25			
25		5.47		6.50	6.87	6.25	5.5		5.2
26	5.20	5.50							
27				6.47			5.4		
28	5.20	5.42		6.32					5.25
29		5.40		6.30					
30									5.25
31	5.20				7.00		5.2		

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SCOTT RIVER AT CALLAHAN, CAL.

LOCATION.—In the NE. ¼ sec. 17, T. 40 N., R. 8 W., at highway bridge in Shasta National Forest, three-fourths mile below junction of East and South forks, 1 mile northwest of Callahan. Wildcat Creek enters 500 feet above and Sugar Creek 1½ miles below the station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—June 12, 1911, to September 30, 1914 (fragmentary).

GAGE.—Vertical staff in two sections on right bank established November 14, 1912; lower section fastened to alder tree 40 feet above bridge; upper section fastened to downstream side of bridge pier. Lower section was destroyed by high water in the spring of 1914. Original gage was just above power house, about 2,000 feet above present site. June 26, 1914, a gage in two sections was installed near upper section of gage at bridge and gage datum was raised 0.91 foot. Observers, Forest Ferguson and F. H. Williams.

DISCHARGE MEASUREMENTS.—Made from highway bridge at gage or by wading.

CHANNEL AND CONTROL.—Gravel and boulders; fairly permanent.

ACCURACY.—Results apparently reliable for periods in which gage at bridge was read; gage above power house was read April 9 to June 24, 1914, and as rating curve for this gage is somewhat uncertain estimates for this period have not been prepared.

COOPERATION.—Station maintained in cooperation with United States Forest Service.

The following discharge measurement was made by H. J. Tompkins:

June 25, 1914: Gage height, 3.23 feet (2.32 feet referred to new gage installed June 26, 1914); discharge, 325 second-feet.

Daily discharge, in second-feet, of Scott River at Callahan, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	June.	July.	Aug.	Sept.
1							
2		23				58	21
3		24	79				
4							
5							
6	21						
7	21		85		215		
8	45	32			215		31
9						43	
10			93		185		
11	21	45					
12	21				135		
13	21		120				
14	21	48					21
15	21						
16	21		143				
17	21						43
18		89			112		
19					172	31	
20					172		
21		103					
22	21					26	
23							
24		99					
25				323			31
26	21			287			
27	21	95					
28		89					
29							
30		83					31
31							

NOTE.—Discharge determined from two poorly defined rating curves.

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SCOTT RIVER NEAR SCOTT BAR, CAL.

LOCATION.—In the NW. ¼ sec. 6, T. 45 N., R. 10 W., at highway bridge 2½ miles northwest of Scott Bar and about half a mile above junction with Klamath River.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 12, 1911, to November 30, 1913, when station was discontinued.

GAGE.—Vertical staff in two sections fastened to left abutment of bridge. Observer, G. A. Milne.

DISCHARGE MEASUREMENTS.—Made from bridges at Scott Bar and at gage or by wading.

CHANNEL AND CONTROL.—Boulders and gravel; somewhat shifting.

EXTREMES OF DISCHARGE.—Maximum stage recorded 1911–1914, 4.5 feet at 7 p. m. June 5, 1912 (discharge, 2,800 second-feet; for stage 4.6 feet May 26 to 28 and June 4, 1913, discharge was 2,610 second-feet); minimum stage recorded, 1.85 feet September 20 and 24 to 28, 1913 (discharge, 64 second-feet; for stage 1.4 feet September 24 to 26, 1911, discharge was 73 second-feet).

DIVERSIONS.—Water is diverted for use in mining and irrigation above the station

ACCURACY.—Rating curve well defined; results good.

No discharge measurements were made during year ending September 30, 1914.

Daily discharge, in second-feet, of Scott River near Scott Bar, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Day.	Oct.	Nov.	Day.	Oct.	Nov.
1	77	107	11	107	256	21	92	256
2	77	107	12	92	256	22	92	230
3	77	107	13	92	230	23	77	230
4	77	107	14	92	230	24	77	230
5	77	183	15	92	221	25	77	230
6	77	532	16	92	221	26	77	282
7	77	532	17	92	230	27	77	399
8	107	399	18	92	230	28	77	399
9	107	282	19	92	230	29	77	399
10	107	282	20	92	256	30	77	339
						31	77	.....

Monthly discharge of Scott River near Scott Bar, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	107	77	86.2	5,300	B.
November	532	107	265	15,800	B.

INDIAN CREEK NEAR HAPPY CAMP, CAL.

LOCATION.—In the NW. ¼ sec. 22, T. 17 N., R. 7 E., at highway bridge at Roberts ranch, in the Klamath National Forest, about 4¾ miles north of Happy Camp and junction with Klamath River.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 8, 1911, to September 30, 1914 (fragmentary).

GAGE.—Staff gage in three sections was installed at bridge November 20, 1912. Section No. 1, vertical, is fastened to stump on right bank 2 feet above bridge; No. 2, vertical, is fastened to right abutment of bridge near downstream end; No. 3, inclined, is fastened to alder tree on left bank 12 feet below bridge. Original gage was vertical staff fastened to alder tree on left bank about 700 feet above bridge at an independent datum. Observer, M. M. Morgan.

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DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Small boulders and gravel; practically permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 7.5 feet at 11 a. m. January 2 (discharge, 3,150 second-feet); minimum stage recorded, 2.5 feet August 19 to September 6 (discharge, 20 second-feet).

1911–1914: Maximum stage recorded, 10.6 feet February 17, 1912 (discharge, 8,430 second-feet); minimum stage recorded, 2.5 feet August 19 to September 6, 1914 (discharge, 20 second-feet). Record consists of occasional gage readings.

DIVERSIONS.—The Reeve Davis Consolidated Mining Co.'s flume diverts water above and returns it to the stream below the station; other small ditches use water for mining purposes.

ACCURACY.—Rating curves for both gages fairly well defined except for high water; results good.

COOPERATION.—Station maintained in cooperation with United States Forest Service.

The following discharge measurement was made by H. J. Tompkins:
June 22, 1914: Gage height, 3.60 feet; discharge, 161 second-feet.

Daily discharge, in second-feet, of Indian Creek near Happy Camp, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	.....	.....	.....	1,570	.....	.....	560	.....	.....	130	.....	20
2	.....	.....	.....	3,150	.....	.....	560	.....	.....	.....	.....	20
3	.....	.....	.....	.....	.....	870	870	.....	.....	180	.....	20
4	.....	43	.....	.....	.....	800	2,070	.....	.....	.....	.....	20
5	.....	.....	.....	1,770	.....	.....	1,570	.....	.....	.....	30	20
6	.....	.....	.....	1,570	.....	430	.....	.....	.....	.....	30	20
7	80	235	.....	2,070	430	1,280	.....	.....	.....	.....	30	37
8	.....	.....	155	1,480	395	1,480	.....	.....	.....	110	30	30
9	.....	110	.....	.....	360	1,570	.....	.....	295	.....	30	28
10	.....	.....	.....	800	395	1,570	.....	.....	.....	.....	30	25
11	55	.....	.....	.....	.....	1,480	.....	.....	295	.....	30	25
12	.....	.....	.....	.....	.....	1,570	.....	.....	295	.....	28	25
13	.....	.....	325	675	.....	.....	1,380	.....	.....	90	28	25
14	.....	80	295	735	.....	.....	.....	800	280	.....	25	25
15	.....	.....	.....	.....	515	1,380	.....	.....	.....	75	25	28
16	.....	.....	.....	.....	.....	.....	1,380	.....	.....	.....	25	120
17	.....	.....	.....	.....	560	1,380	1,100	675	.....	.....	22	.....
18	.....	.....	155	560	615	.....	.....	.....	265	.....	22	155
19	.....	.....	.....	470	800	.....	1,280	.....	205	.....	20	.....
20	.....	.....	.....	1,200	1,100	.....	.....	.....	.....	.....	20	.....
21	.....	110	.....	1,280	.....	.....	.....	.....	.....	.....	20	.....
22	.....	.....	.....	2,170	1,100	.....	.....	735	.....	.....	20	.....
23	.....	.....	155	.....	870	1,380	.....	615	.....	.....	20	.....
24	.....	.....	.....	.....	870	1,020	.....	.....	205	.....	20	.....
25	.....	.....	.....	2,170	.....	.....	.....	515	180	.....	20	.....
26	.....	.....	.....	1,670	.....	870	.....	.....	180	.....	20	.....
27	.....	.....	.....	1,200	.....	735	.....	.....	.....	.....	20	.....
28	.....	.....	.....	.....	.....	.....	560	.....	.....	.....	20	.....
29	.....	.....	.....	735	.....	675	.....	.....	130	47	20	.....
30	.....	360	412	675	.....	615	.....	.....	.....	.....	20	37
31	38	.....	.....	615	.....	2,600	.....	.....	.....	.....	20	.....

NOTE.—Discharge determined from a well-defined rating curve.

SALMON RIVER AT SOMESBAR, CAL.

LOCATION.—In the SE. ¼ sec. 2, T. 13 N., R. 6 E., below suspension footbridge about 600 feet northeast of Somesbar post office and about 1¼ miles above junction with Klamath River.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 17, 1911, to September 30, 1914.

GAGE.—Vertical staff in two sections on right bank about 900 feet below bridge; lower section is fastened to an alder tree; upper section is fastened to an alder tree *15 feet upstream.*

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TRINITY RIVER AT LEWISTON, CAL.

LOCATION.—In the NE. ¼ sec. 19, T. 33 N., R. 8 W., at highway bridge at Lewiston, and about 9 miles below Stewarts Fork. Indian Creek enters 6 miles below the station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—August 28, 1911, to September 30, 1914.

GAGE.—Vertical staff in two sections on left bank at bridge; lower section fastened to pile 10 feet above bridge; upper section fastened to downstream end of bridge abutment. Observer, W. W. Phillips.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Small boulders and gravel; apparently permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 16.7 feet at 12.30 p. m. January 2 (discharge, computed from extension of rating curve, 26,900 second-feet); minimum stage recorded, 2.3 feet October 1 to 7 (discharge, 150 second-feet).

1911–1914: Maximum stage recorded, 16.7 feet at 12.30 p. m. January 2, 1914 (discharge, 26,900 second-feet); minimum stage recorded, 2.28 feet September 1, 1911 (discharge, 145 second-feet).

DIVERSIONS.—Water is diverted above the station for irrigation, placer mining, and power development.

ACCURACY.—Rating curve well defined; results excellent.

No discharge measurements made during the year.

Daily discharge, in second-feet, of Trinity River at Lewiston, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1	150	205	575	11,100	2,110	4,240	3,120	4,090	6,680	2,230	360	175
2	150	258	545	24,600	2,000	4,390	2,990	5,160	6,320	2,230	385	175
3	150	240	488	10,900	2,000	3,800	3,520	6,680	5,640	2,110	360	175
4	150	240	460	7,850	1,890	3,800	8,880	7,060	4,840	1,780	360	175
5	150	295	435	6,680	1,780	4,090	8,250	6,680	3,520	1,780	338	175
6	150	1,340	410	5,480	1,680	5,000	7,450	6,680	3,250	1,580	338	175
7	150	575	360	5,480	1,680	5,320	5,980	7,250	2,990	1,580	315	175
8	175	460	360	4,390	1,680	5,480	5,810	6,150	2,990	1,340	315	205
9	175	410	360	3,520	1,580	5,640	8,050	5,980	2,860	1,340	315	190
10	175	410	360	2,990	1,580	5,980	10,400	5,640	2,990	1,340	295	175
11	150	360	460	2,730	1,580	6,320	8,670	5,810	2,990	1,140	315	175
12	150	360	435	2,350	1,780	6,500	5,980	6,320	3,380	1,180	295	175
13	175	360	1,780	2,230	1,780	6,320	5,810	7,450	3,250	1,020	275	175
14	175	338	1,310	3,800	1,780	6,500	6,680	7,450	3,250	942	275	175
15	175	315	835	3,520	1,780	6,320	10,400	7,450	3,520	905	258	175
16	175	315	668	3,250	1,890	6,320	7,850	7,450	3,940	870	240	175
17	175	315	635	4,690	2,470	6,320	6,320	7,060	3,800	870	258	410
18	175	488	545	3,520	6,680	6,680	6,680	6,680	4,090	870	222	295
19	175	545	515	2,860	10,900	6,680	8,670	7,060	4,090	835	222	275
20	175	515	515	2,470	11,300	6,680	9,090	7,650	4,090	835	190	190
21	175	435	515	2,730	15,100	6,680	9,520	7,250	2,860	800	175	240
22	175	360	575	2,990	8,460	7,060	5,980	7,060	2,470	732	175	295
23	175	338	545	2,990	5,980	7,060	5,320	5,980	2,730	668	175	222
24	175	315	575	4,540	5,000	5,980	4,690	5,810	2,470	575	175	205
25	175	360	575	5,980	4,390	5,320	4,390	6,150	2,350	515	175	190
26	175	905	700	6,680	3,800	4,540	3,800	5,480	2,230	460	175	190
27	175	2,230	668	4,390	3,380	3,800	3,660	5,320	2,230	488	175	222
28	175	1,140	652	3,800	3,380	3,520	3,520	5,640	2,230	460	162	205
29	175	800	635	2,730	.....	3,660	3,520	5,480	2,230	460	175	205
30	175	732	942	2,230	.....	3,250	3,520	6,150	2,230	410	190	205
31	190	.....	15,100	2,230	.....	2,860	.....	6,680	.....	385	190	.....

NOTE.—Discharge determined from a well-defined rating curve. No record Dec. 14 and 28; discharge interpolated.

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Monthly discharge of Trinity River at Lewiston, Cal., for the year ending Sept. 30, 191

Month.	Diascharge in second-feet.			Run-off (total in acre-feet).	Acc rac
	Maximum.	Minimum.	Mean.		
October	190	150	168	10,300	B.
November	2,230	205	532	31,700	A.
December	15,100	360	1,080	66,400	A.
January	24,600	2,230	5,020	309,000	B.
February	15,100	1,580	3,910	217,000	A.
March	7,060	2,860	5,360	330,000	A.
April	10,400	2,990	6,280	374,000	A.
May	7,650	4,090	6,410	394,000	A.
June	6,680	2,230	3,420	204,000	A.
July	2,230	385	1,060	65,200	A.
August	385	162	254	15,600	B.
September	410	175	206	12,300	B.
The year	24,600	150	2,800	2,030,000	

TRINITY RIVER AT HOOPA, CAL.

LOCATION.—In the NW. ¼ sec. 25, T. 8 N., R. 4 E., at Hoopa Indian Agency, abou a mile above Hoopa Ferry, and about 11 miles above junction with Klamat River.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—September 3, 1911, to February 1, 1914.

GAGE.—Staff in three sections on left bank 800 feet above mouth of Supply Creek.

DISCHARGE MEASUREMENTS.—Made from car on ferry cable 1 mile below gage. A Supply Creek enters between gage and ferry, it is necessary to deduct discharg of this stream from measurements made at ferry to obtain flow at gage.

CHANNEL AND CONTROL.—Sand and gravel; fairly permanent.

EXTREMES OF DISCHARGE.—Maximum stage recorded during year, 28.1 at 5 p. m December 31 (discharge, computed from extension of rating curve, 89,0(second-feet); minimum stage recorded, 4.4 feet October 5 and 6 (discharge, 47 second-feet).

1911–1914: Maximum stage recorded, 28.1 at 5 p. m. December 31, 1913 (di charge, 89,000 second-feet); minimum stage recorded, 4.4 feet September 1911 (discharge, 375 second-feet).

ACCURACY.—Rating curve fairly well defined at low and medium stages; results good

COOPERATION.—Maintained in cooperation with superintendent United States India Service.

No discharge measurements made during the year.

Daily discharge, in second-feet, of Trinity River at Hoopa, Cal., for the year ending Sep 30, 1914.

Day.	Oct.	Nov.	Dec.	Jan.	Feb.	Day.	Oct.	Nov.	Dec.	Jan.	Feb.
1	505	695	2,900	65,600	15,400	16	590	965	2,910	25,900	.....
2	505	695	2,410	76,300	.....	17	568	1,040	2,650	25,900	.....
3	505	668	2,180	60,100	.....	18	568	1,760	2,410	20,100	.....
4	488	640	1,960	42,500	.....	19	545	1,760	2,180	17,100	.....
5	470	788	1,760	31,700	.....	20	545	1,760	2,070	18,200	.....
6	470	5,280	1,660	29,900	.....	21	545	1,760	2,180	32,600	.....
7	488	4,390	1,560	29,400	.....	22	545	1,560	2,910	59,100	.....
8	590	4,070	1,560	28,100	.....	23	545	1,380	3,040	43,000	.....
9	695	3,460	1,480	29,000	.....	24	545	1,210	3,460	38,200	.....
10	640	1,560	1,660	25,000	.....	25	545	1,210	4,730	43,500	.....
11	615	1,040	1,760	17,100	.....	26	545	2,410	5,090	54,100	.....
12	615	1,040	1,960	15,700	.....	27	545	5,670	4,070	44,400	.....
13	590	965	2,910	18,600	.....	28	545	5,280	3,460	27,700	.....
14	590	965	4,390	20,500	.....	29	545	4,070	3,610	22,500	.....
15	590	890	3,460	24,200	.....	30	545	3,610	4,910	19,700	.....
						31	545	.....	63,100	17,100	.....

NOTE.—Discharge determined from a fairly well defined rating curve.

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Monthly discharge of Trinity River at Hoopa, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	Accuracy.
	Maximum.	Minimum.	Mean.		
October	695	470	554	34,100	B.
November	5,670	640	2,090	124,000	B.
December	63,100	1,480	4,720	290,000	C.
January	76,300	15,700	33,000	2,030,000	D.
The period				2,480,000	

COFFEE CREEK AT COFFEE, CAL.

LOCATION.—In the NW. ¼ sec. 4, T. 37 N., R. 8 W., at private highway bridge at Coffee, in Shasta National Forest 5 miles above junction with Trinity River. Boulder Creek enters 400 feet above and Little Boulder Creek 1¼ miles below the station.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—December 16, 1910, to September 30, 1914 (not complete).

GAGE.—Vertical staff fastened to upstream end of bridge pier near right bank. Observer, T. E. Abernathy.

DISCHARGE MEASUREMENTS.—Made from downstream side of bridge or by wading.

CHANNEL AND CONTROL.—Gravel and boulders; fairly permanent.

EXTREMES OF DISCHARGE.—1911–1914: [1] Maximum stage recorded, 7.0 feet May 27 and June 3 to 5, 1912 (discharge, 2,630 second-feet); minimum stage recorded, 3.45 feet September 28 to 30, 1914 (discharge, 34 second-feet).

REGULATION.—From April to July, inclusive, and occasionally throughout the remainder of the year, two dams with automatic or "self-shooting" gates are operated about 10 miles above the station. The Nash mine operates a dam having a working capacity of about 125 acre-feet. The Holland mine, on the East Fork, operates a dam having a working capacity of about 40 acre-feet. At the beginning of the season, in April, these dams fill and "shoot" about once an hour; at the end of the season, in July, once in 20 or 24 hours. During high water these "floods" are hardly perceptible, but late in the season their effect is pronounced. An effort is made to obtain gage readings when the flow is normal.

ACCURACY.—No discharge measurements made during the year. The rating curve for 1912–13 was used for 1913–14. The gage-height record, on account of the operation of the self-shooting dam, is subject to some error; otherwise results are good.

COOPERATION.—Station maintained in cooperation with the United States Forest Service.

No discharge measurements were made during the year.

[1] Record fragmentary.

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Daily discharge, in second-feet, of Coffee Creek at Coffee, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	June.	July.	Aug.	Sept.	Day.	Oct.	June.	July.	Aug.	Sept.
1	48	.....	580	130	58	16	53	790	280	81	88
2	47	.....	580	130	53	17	53	1,700	262	81	95
3	47	.....	520	111	53	18	50	1,700	262	75	95
4	46	.....	415	95	48	19	51	1,400	300	75	81
5	46	.....	415	95	48	20	.....	645	262	69	75
6	46	.....	415	81	48	21	.....	580	210	69	58
7	53	.....	365	88	48	22	.....	580	178	69	58
8	81	.....	390	81	48	23	.....	715	165	69	53
9	58	.....	342	81	44	24	.....	645	165	64	48
10	53	.....	342	81	44	25	.....	580	152	64	44
11	53	.....	320	81	44	26	.....	580	152	64	39
12	53	.....	320	81	39	27	.....	580	152	58	39
13	53	.....	320	81	39	28	.....	580	152	58	34
14	53	.....	300	81	39	29	.....	580	152	58	34
15	55	790	300	81	58	30	.....	580	152	58	34
						31	.....	.....	130	58	.....

NOTE.—Discharge determined from a fairly well defined rating curve.

Monthly discharge of Coffee Creek at Coffee, Cal., for the year ending Sept. 30, 1914.

Month.	Discharge in second-feet.			Run-off (total in acre-feet).	A[illegible] re[illegible]
	Maximum.	Minimum.	Mean.		
October 1–19	81	46	52.6	1,980	
June 15–30	1,700	580	814	25,800	
July	580	130	292	18,000	
August	130	58	79.0	4,860	
September	95	34	52.9	3,150	

EAST FORK OF TRINITY RIVER NEAR TRINITY CENTER, CAL.

LOCATION.—In the SW. ¼ sec. 15, T. 36 N., R. 7 W., at highway bridge 2½ miles sou[illegible] east of Trinity Center, in Shasta National Forest, and one-fourth mile abo[illegible] junction with Trinity River.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—December 15, 1910, to September 30, 1914 (fragmentary).

GAGE.—Vertical staff on downstream end of left abutment of bridge. Observe[illegible] R. W. Doney, G. W. Rice, R. F. Bassham, and M. Boswell.

DISCHARGE MEASUREMENTS.—Made from downstream side of bridge or by wading.

CHANNEL AND CONTROL.—Gravel and small boulders; fairly permanent. The sectio[illegible] at the bridge is poor for measurements at low stages because of ponded water.

DIVERSIONS.—About 400 acres are irrigated from this stream. The principal diversion is the Trinity Farm & Cattle Co.'s canal, which heads about 4 miles above the station. Some water is also used for mining.

ACCURACY.—Rating curve for 1912–13 was used for 1913–14; no discharge measurements made during the year.

COOPERATION.—Station maintained in cooperation with United States Forest Service.

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Daily discharge, in second-feet, of East Fork of Trinity River near Trinity Center, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	May.	June.	July.	Aug.	Sept.
1				1,160			
2	7					114	
3							
4							
5							
6							60
7			1,740		192		
8				495			
9				495			
10							
11	11						
12			1,520				
13					162		
14							
15							
16							
17							
18				390			
19		42					
20							
21							
22							104
23	7					60	
24		27					
25							
26				302			
27			1,020				
28							
29							
30							
31							

NOTE.—Discharge determined from a fairly well defined rating curve.

SWIFT CREEK NEAR TRINITY CENTER, CAL.

LOCATION.—In the E. ½ sec. 13, T. 36 N., R. 8 W., one-fourth mile above junction with North Fork of Swift Creek, in Shasta National Forest, and about 2½ miles southwest of Trinity Center.

DRAINAGE AREA.—Not measured.

RECORDS AVAILABLE.—December 17, 1910, to September 30, 1914 (fragmentary).

GAGE.—Vertical staff in two sections on left bank 100 feet below foot log; lower section is bolted to boulder; upper section is fastened to cedar tree 6 feet back from low-water section. Observer, R. W. Doney, and G. W. Rice.

DISCHARGE MEASUREMENTS.—Made from foot log or by wading.

CHANNEL AND CONTROL.—Boulders; rough; fairly permanent.

ACCURACY.—Rating curve for 1912–13 was used for 1913–14; no discharge measurements made during the year.

COOPERATION.—Gage-height record furnished by United States Forest Service.

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Daily discharge, in second feet, of Swift Creek, near Trinity Center, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	May.	June.	July.	Aug.	Sept.	Day.	Oct.	May.	June.	July.	Aug.	Sept.
1							16						
2							17						
3							18						39
4							19						
5					56	18	20						
6							21						
7							22						
8							23						
9							24						
10							25	14					
11							26		583				
12							27				62	21	
13			424		50		28						
14				122			29		754				
15	15						30						
							31						

NOTE.—Discharge determined from a fairly well defined rating curve.

SMITH RIVER BASIN.

NORTH FORK OF SMITH RIVER NEAR CRESCENT CITY, CAL.

LOCATION.—In the SW. ¼ NE. ¼ sec. 20, T. 17 N., R. 2 E., half a mile northeast of Gasquet, in Klamath National Forest, half a mile above junction of North and Middle forks, and about 15 miles northeast of Crescent City.

DRAINAGE AREA.—81 square miles.

RECORDS AVAILABLE.—September 8, 1911, to September 30, 1914.

GAGE.—Staff in four sections on left bank. Observer, A. W. Lewis.

DISCHARGE MEASUREMENTS.—Made from cable at gage or by wading.

CHANNEL AND CONTROL.—Boulders and gravel; rough; fairly permanent.

EXTREMES OF DISCHARGE.—Maximun stage recorded during year, 16.8 feet at 9 a. m. November 6 (discharge, 6,050 second-feet); minimum stage recorded, 8.92 feet August 24 (discharge, 86 second-feet; record fragmentary).

1911–1914: Maximum stage recorded, 26.5 feet in the early morning of February 17, 1912 (discharge, computed from extension of rating curve, 27,000 second-feet); minimum stage recorded, 3.45 feet November 4, 1911 (discharge, 64 second-feet).

ACCURACY.—An average rating curve, which is fairly well defined, has been developed; results good.

COOPERATION.—Station maintained in cooperation with the United States Forest Service.

No discharge measurements made during the year.

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Daily discharge, in second feet, of North Fork of Smith River, near Crescent City, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1						1,400	590		206		
2						1,730	555	228	186		
3					1,730	2,480		240	186		
4		265			1,480	4,360	488				
5		394			1,480						
6	94	6,050	705		1,330	1,820	456		176	100	
7	456				1,140	1,330	424		166		
8	1,730					1,140	424				106
9			590		930	1,140	456				
10			555		930	2,280		456			
11		835			835	2,280	379	394	157		
12		790					364	364		94	
13						2,480		334	148		
14	424					2,100					2,880
15	364					6,500		278	140		
16	334					2,580		278		94	
17	306	520						252			2,880
18	252	1,030						240			
19		790		930			278	228			
20	206	1,030					278	228			
21	206	1,400									
22	186	1,260				880		206			
23	176				456	790		206			
24		1,140				745				86	
25		930						334	112		
26		2,880	3,760		364	835		292			
27	148				364	790		278			
28	148				394	705					364
29	132					625		228			
30	132				1,140	625		206			
31					1,560						

NOTE.—Discharge determined from a fairly well defined rating curve.

MIDDLE FORK OF SMITH RIVER NEAR CRESCENT CITY, CAL.

LOCATION.—In the NE. ¼ SE. ¼ sec. 20, T. 17 N., R. 2 E., at highway bridge, 800 feet above junction of North and Middle forks, one-eighth mile east of Gasquet, and 14 miles northeast of Crescent City in Klamath National Forest.

DRAINAGE AREA.—146 square miles.

RECORDS AVAILABLE.—September 8, 1911, to September 30, 1914 (not complete).

GAGE.—Chain gage attached to downstream guard rail of bridge. May 26, 1913, an inclined staff in two sections was installed on right bank 60 feet upstream from bridge; original datum not maintained. Observer, A. W. Lewis.

DISCHARGE MEASUREMENTS.—Made from bridge or by wading.

CHANNEL AND CONTROL.—Boulders and gravel; rough; somewhat shifting.

EXTREMES OF DISCHARGE.—1911–1914: Maximum stage recorded, 17.1 feet at 8 a. m. February 17, 1912 (discharge, 21,500 second-feet); minimum stage recorded, 4.00 feet November 4, 1911 (discharge, 60 second-feet; for stage 3.72 feet October 26, 1913, discharge was 62 second-feet).

ACCURACY.—Rating curves fairly well defined; results fair.

COOPERATION.—Station maintained in cooperation with the United States Forest Service.

No discharge measurements made during the year.

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Daily discharge, in second-feet, of Middle Fork of Smith River near Crescent City, Cal., for the year ending Sept. 30, 1914.

Day.	Oct.	Nov.	Dec.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1						735	425	205	110		
2						812	425	190	104		
3					1,270	1,070	445	185	100		
4	65	110			1,140	1,970	405	165	100		
5	70	130	505		1,140	1,570			100		
6	70	2,450	465	710	1,070	1,010	350		96	51	45
7	140			635	1,010	840	350		90		
8	385		405		950	760	368				61
9			385		895	1,010	385		84		
10			365		686	1,770		205	84		
11		280	445		812	2,060	315	190	84		
12		280				1,270	315	185	90	47	
13		250				1,490		178	90	56	51
14	152					1,270	315	165	90	45	61
15	120	220				4,020		165	76		
16	120	190				2,650	280	160	72	56	1,270
17	104	220					280	160	66	51	736
18	90	545						145			785
19	80	385		785			265	140	64		370
20	80	505		950			250	136	51		
21	85	635						136			
22	85	545			525	710		124			
23	85				465	635		124			
24	78	545	1,140			590			68	54	
25	73	465	3,070					145		45	
26	62	950	2,150		350	612		136	66		
27	85	2,060	1,490		368	505		124			
28	68	1,490			350	465		120			100
29	78				465	465		120			
30	78				685	425		110		47	
31					735		205				

NOTE.—Discharge determined from two fairly well defined rating curves: one referred to the chain gage and the other to the staff gage.

MISCELLANEOUS MEASUREMENTS.

Miscellaneous discharge measurements in Pacific slope drainage basins during the year ending Sept. 30, 1914.

Streams south of San Francisco Bay.

Date.	Stream.	Tributary to or diverts from—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Dec. 19	Cottonwood Creek	Tia Juana River	Road crossing near Campo, Cal.		1.5
Mar. 7	Sweetwater River	Pacific Ocean	Near Jamacho, 1½ miles above Sweetwater dam.		12
Oct. 3	Ellis flume	Sweetwater River	In flume, 300 feet above U. S. Geological Survey gage on Sweetwater River near Descanso, Cal.		a.25
Apr. 20	San Diego River	Pacific Ocean	One-fourth mile above mouth of Boulder Creek near Lakeside, Cal.		4.4
May 13	do	do	do		7.3
Feb. 2	San Vicente Creek	San Diego River	Foster, Cal.		1.8
Mar. 4	do	do	do		12
Apr. 23	do	do	do		3.5
May 12	do	do	do		a.2
July 13	Santa Ysabel Creek	San Dieguito River	Near Santa Ysabel, Cal. Cut-out in pipe line at the Santa Ysabel ranch.		a.4
Sept. 8	do	do	do		.1

a Estimated.

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Miscellaneous discharge measurements in Pacific slope drainage basins during the year ending Sept. 30, 1914—Continued.

Streams south of San Francisco Bay—Continued.

Date.	Stream.	Tributary to or diverts from—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
June 12	East San Pasqual ditch.	Santa Ysabel Creek...	Made at headgate near Escondido, Cal.	0.35	3.0
May 10	San Luis Rey River.	Pacific Ocean.....	75 feet above intake of Escondido Mutual Water Co.'s canal near Valley Center, Cal.	.....	18
Oct. 17	Canada Agua Caliente.	San Luis Rey River...	Warner Springs, Cal., 1,000 feet below the hot springs.	.....	.1
Feb. 4	.....do.....	.....do.....	.....do.....	1.03	a.2
Mar. 6	.....do.....	.....do.....	.....do.....	.95	1.0
24	.....do.....	.....do.....	.....do.....	.....	a.4
May 9	.....do.....	.....do.....	.....do.....	.....	a.4
9	.....do.....	.....do.....	.....do.....	.....	a.6
22	.....do.....	.....do.....	.....do.....	.....	a.2
June 15	.....do.....	.....do.....	Warner Springs, Cal., 500 feet above hot springs.	.....	a.15
July 11	.....do.....	.....do.....	1,000 feet above the hot springs.	.....	a.1
11	.....do.....	.....do.....	1,000 feet below the hot springs.	.....	a.1
Jan. 9	Buena Vista Creek..	.....do.....	Near Warner Springs, Cal., one-half mile below ranch house.	.....	a.1
30	.....do.....	.....do.....	.....do.....	.....	a.2
Feb. 4	.....do.....	.....do.....	.....do.....	1.80	a.3
4	.....do.....	.....do.....	400 feet below road crossing near Monkey Hill.	.....	a.3
Mar. 25	.....do.....	.....do.....	Near Warner Springs, Cal., one-half mile below Warner ranch house.	1.73	a.1
May 8	.....do.....	.....do.....	.....do.....	1.70	a.02
July 11	.....do.....	.....do.....	.....do.....	.....	a.02
Oct. 14	Big Lake Creek.....	.....do.....	Near Warner Springs, Cal.	1.97	a.02
Jan. 9	.....do.....	.....do.....	.....do.....	2.03	a.06
30	.....do.....	.....do.....	.....do.....	2.00	a.1
Mar. 25	.....do.....	.....do.....	.....do.....	2.07	a.1
Apr. 14	.....do.....	.....do.....	.....do.....	2.11	a.04
May 8	.....do.....	.....do.....	.....do.....	2.18	.05
Apr. 25	Lusardi Creek.....	.....do.....	Near Mesa Grande, Cal....	.....	1.3
May 14	.....do.....	.....do.....	.....do.....	.....	.7
28	.....do.....	.....do.....	.....do.....	.....	.5
10	Escondido Mutual Water Co.'s canal.	.....do.....	Near Valley Springs, Cal., 150 feet below measuring weir.	.....	17.5
Jan. 24	Pauma Creek.....	.....do.....	Near Pala, Cal.....	.73	2.2
Apr. 25	.....do.....	.....do.....	.....do.....	.....	10
May 14	.....do.....	.....do.....	.....do.....	.....	3.6
28	.....do.....	.....do.....	.....do.....	.....	1.2
Oct. 6	Moreno ditch.....	.....do.....	Pala, Cal.....	.....	a.25
Mar. 10	Temecula Creek.....	Santa Margarita River.	Near Temecula, Cal. Old U. S. Geological Survey gaging station.	7.60	10
May 8	.....do.....	.....do.....	.....do.....	.....	9.1
8	Murrieta Creek.....	Temecula Creek.....	300 feet above mouth, near Temecula, Cal.	.....	1.2
Feb. 28	Plunge Creek.....	Santa Ana River.....	Near East Highlands, Cal., at highway bridge on Canyon road.	.....	59
Mar. 10	.....do.....	.....do.....	.....do.....	.....	18
May 15	.....do.....	.....do.....	.....do.....	.....	11
Mar. 10	City Creek.....	.....do.....	Highlands, Cal., made at bridges on Base Line road	.....	35
May 15	.....do.....	.....do.....	.....do.....	.....	18
Sept. 1	San Gabriel River...	Pacific Ocean.....	Diverting dam near Azusa, Cal.	.....	55
Feb. 26	Millard Canyon Creek	Arroyo Seco, which is tributary to Los Angeles River.	Mouth, near Arroyo Seco near Pasadena, Cal.	.....	20
Mar. 12	.....do.....	.....do.....	.....do.....	.....	4.7
May 4	.....do.....	.....do.....	.....do.....	.....	1.9
Oct. 21	Santa Clara River...	Pacific Ocean.....	Above mouth of San Francisquito Creek, 4 miles northwest of Saugus, Cal.	.....	12
Jan. 2	.....do.....	.....do.....	.....do.....	.....	14
Sept. 18	.....do.....	.....do.....	.....do.....	.....	11

a Estimated.

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Miscellaneous discharge measurements in Pacific slope drainage basins during the year ending Sept. 30, 1914—Continued.

Streams south of San Francisco Bay—Continued.

Date.	Stream.	Tributary to or diverts from—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Oct. 21	San Francisquito Creek.	Santa Clara River	Castaic, Cal., near Saugus, Cal.		1.2
Jan. 2	do	do	do		2.0
Apr. 8	Castaic River	Santa Clara River	Near Saugus, Cal., at Southern Pacific railroad bridge.		39
Oct. 21	Piru Creek	do	Near Piru, Cal., at U. S. Geological Survey gaging station.	2.48	9.7
Jan. 3	do	do	do	3.15	34
Sept. 18	do	do	do		14
Oct. 21	Sespe Creek	do	Sespe, Cal.		Dry.
Jan. 4	do	do	do		29
5	do	do	do	3.79	28
Apr. 12	do	do	1,000 feet above Southern Pacific railroad bridge.		140
May 26	do	do	Near Sespe, Cal.	6.84	81
26	do	do	Sespe, Cal.		57
26	Fillmore Land & Water Co. canal.	Sespe Creek	Near Sespe, Cal., at headgate.		17
Oct. 21	Santa Paula Creek	Santa Clara River	Near Santa Paula, Cal., at U. S. Geological Survey gage.	2.97	1.5
Jan. 5	do	do	do		7.3
Apr. 8	do	do	do		35
May 30	do	do	do		17
Oct. 21	Sisar Creek	Santa Paula Creek	Near Santa Paula, Cal.		a9.1
Jan. 5	do	do	do		8
Apr. 8	do	do	do		10
May 30	do	do	do		4.2
Mar. 18	Ventura River	Pacific Ocean	Near Ventura, Cal., 200 yards above mouth of Coyote Creek.		280
Apr. 9	do	do	do		167
May 30	do	do	do		69
Oct. 22	North Fork Matilija River.	Ventura River	Near Nordhoff, Cal., 100 feet above mouth.		1.1
Mar. 17	do	do	do		42
Apr. 9	do	do	do		22
May 30	do	do	do		9.8
Sept. 19	do	do	do		3.2
Oct. 22	Sheldon flume	North Fork of Matilija River.	Near Nordhoff, Cal., 50 feet below intake.		1.0
Sept. 19	do	do	do		1.6
Apr. 9	Ojai Creek	Ventura River	Nordhoff, Cal.		11
Mar. 18	San Antonio Creek	do	La Crosse near Nordhoff, Cal.		60
Apr. 9	do	do	do		46
May 30	do	do	do		24
Oct. 23	Coyote Creek	do	Near Ventura, Cal., 250 feet above mouth.		a.3
Mar. 18	do	do	do		32
Apr. 9	do	do	do		16
May 30	do	do	do		6.9
28	Santa Ynez River	Pacific Ocean	Solvang, Cal., United States Geological Survey gage.	2.40	89
29	do	do	do	2.39	89
Dec. 28	do	do	United States Geological Survey gaging station, 3 miles east of Surf, Cal.	3.15	53
Jan. 5	do	do	do	3.40	101
9	do	do	do	3.30	65
13	do	do	do	3.25	58
15	do	do	do	3.92	294
18	do	do	do	9.00	22,700
19	do	do	do	2.90	3,420
20	do	do	do	2.40	1,440
21	do	do	do	2.30	1,080
24	do	do	do	2.10	577

a Estimated.

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Miscellaneous discharge measurements in Pacific slope drainage basins during the year ending Sept. 30, 1914—Continued.

Streams south of San Francisco Bay—Continued.

Date.	Stream.	Tributary to or diverts from—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
Feb. 11	Devils Creek	Santa Ynez River	Near Santa Barbara, Cal., one-fourth mile above U. S. Geological Survey station on Santa Ynez River.		4.8
12	do	do	do	1.59	2.9
13	do	do	do		2.4
17	do	do	do		2.1
Apr. 21	do	do	do		1.0
Dec. 17	Fall Creek	San Lorenzo River	Felton, Cal.		1.8
17	Zayante Creek	do	do		3.9
17	Bean Creek	Zayante Creek	do		2.9
17	Brancifarte Creek	San Lorenzo River	Santa Cruz, Cal., 100 feet above diversion dam.		1.5
16	Coja Creek [a]	Pacific Ocean	Santa Cruz, Cal.		1.0
16	Coja flume	Coja Creek	Santa Cruz, Cal., 15 feet below wasteway.		.6
16	Laguna Creek	Pacific Ocean	Santa Cruz, Cal., 200 feet above city of Santa Cruz dam.		1.7
		Kern River basin.			
Oct. 3	Kern River	Kern basin	Above Kernville, sec. 16, T. 17 S., R. 33 E.		98
3	do	do	do		89
2	do	do	Above Kernville, sec. 16, T. 18 S., R. 33 E.		112
Sept. 28	do	do	Above Golden Trout Creek above Kernville, sec. 16, T. 18 S., R. 33 E.		253
Oct. 1	do	do	Above Upper Kern Lake above Kernville, sec. 33, T. 18 S., R. 33 E.		136
Sept. 29	do	do	do		325
Oct. 1	do	do	Below Kern Lake above Kernville, sec. 4, T. 19 S., R. 33 E.		139
Sept. 29	do	do	do		332
Oct. 6	do	do	Kernville, sec. 14, T. 20 S., R. 33 E.		161
2	Golden Trout Creek	Kern River	Above Kernville, sec. 21, T. 18 S., R. 33 E.		36
Sept. 28	do	do	do		60
Oct. 4	Coyote Creek	do	Above Kernville, sec. 20, T. 18 S., R. 33 E.		4.9
Sept. 28	do	do	Above Kernville, sec. 21, T. 18 S., R. 33 E.		6.0
Oct. 7	Ninemile Creek	do	Above Kernville, sec. 35, T. 20 S., R. 33 E.		13
Sept. 30	do	do	do		27
Oct. 6	Rattlesnake Creek	do	Above Kernville, sec. 3, T. 21 S., R. 33 E.		8.3
Mar. 21	Erskine Creek	do	Isabella at old U. S. Geological Survey gaging station.	2.82	12
May 25	do	do	do	2.58	3.8
		Tulare Lake basin.			
Oct. 16	Middle Fork Kaweah River.	Kaweah River	Near Hammond at old U. S. Geological Survey gaging station.	5.50	22
17	East Fork Kaweah River.	do	do	5.39	23
15	North Fork Kaweah River.	do	Near Kaweah at old U. S. Geological Survey gaging station.	6.07	59
		San Joaquin River basin.			
Jan. 11	Hazel Green Creek	South Fork of Tuolumne River.	Mouth at Harden's ranch near Sequoia.		1.4
Mar. 26	do	do	do		3
May 18	do	do	do		1.4
Sept. 29	do	do	Mouth at Harden's ranch near Sequoia, Cal.		[b] .6
15	Beaver Creek	North Fork of Stanislaus River.	200 feet below a diversion canal near Avery.		[b] .4
15	Utica Gold Mining canal.	Beaver Creek	Near Avery		6.3

[a] Locally known as Major Creek.

[b] Estimated.

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Miscellaneous discharge measurements in Pacific slope drainage basins during the year ending Sept. 30, 1914—Continued.

Sacramento River basin.

Date.	Stream.	Tributary to or diverts from—	Locality.	Gage height.	Discharge.
				Feet.	*Sec.-ft.*
July 1	Fall River	Pit River	Fall River Mills, Cal.	2.10	1,530
Jan. 30	Montgomery Creek	do	Montgomery Creek, Cal.	2.05	215
14	Sacramento River	San Francisco Bay	Jellys Ferry, Cal.		a 110,000
22	do	do	do		a 139,000
Feb. 12	do	do	do		a 16,300
Aug. 4	Indian Creek	North Fork of Feather River.	Above Taylorville, Cal.		52
3	North Fork Lights Creek.	Lights Creek	Near Taylorville, Cal.		.9
3	East Fork Lights Creek.	do	do		1.6
3	Morton Creek	do	do		1.7
3	Lights Creek	Indian Creek	Above Taylorville, Cal.		3.9
20	Middle Fork Yuba River.	Yuba River	North San Juan, Cal.		40
Nov. 25	Seigler Creek	Cache Creek	Near Lower Lake, Cal.		6.9
Jan. 31	do	do	do		26
Mar. 27	do	do	do		6.4
June 4	do	do	do		.7

Streams north of San Francisco Bay.

Apr. 23	Williamson River	Upper Klamath Lake.	Ball ranch, near head of Klamath Marsh, Oreg.		165
Aug. 13	do	do	do		78.2
Apr. 24	Big Spring	Williamson River in Klamath Marsh.	Fort Klamath-Crescent, Oreg., road crossing.		61.4
Aug. 12	do	do	do		70.8
12	do	do	Three-fourths mile below road, below last spring.		62.5
11	Sand Creek	Williamson River	Mouth of canyon		37.4
Apr. 21	do	do	Fort Klamath-Crescent, Oreg., road, sec. 27, T. 31 S., R. 7 E.		26.5
Aug. 10	do	do	do		27.3
11	Cow Creek	do	One-fourth mile below head.		2.3
14	Clear Creek	do	8 miles north of Chiloquin, Oreg.		11.2
Feb. 5	Brown Creek	Sprague River, 2 miles above Sycan River.	Near mouth	0.40	14.5
Aug. 27	do	do	do	.40	11.7
27	Roger Spring	Sycan River	Three-fourths mile above mouth.		5.0
4	Snake Creek	do	David Choctoot's place		3.9
28	do	do	do		3.8
Feb. 24	Whiskey Creek	Sprague River, 4 miles below Sycan River.	Bridge 3 miles above mouth.		49.3
Aug. 5	do	do	do		10.6
28	do	do	do		9.2
3	Trout Creek	Sprague River	Saddle Mountain highway		2.9
28	do	do	do		2.5
May 18	Harold Creek	Williamson River, from high canyon Modoc Point.	Site of small reservoir		7.0
Mar. 13	Fort Creek	Wood River	1 mile south of Fort Klamath, Oreg., sec. 27, T. 33 S., R. 6 E.	5.00	102
Apr. 8	do	do	do	5.00	98.7
June 12	Crooked Creek	do	1½ miles north of Klamath Agency, Oreg.		38.3
22	Reeve Davis flume	Indian Creek	Near Happy Camp, Cal., at old U. S. Geological Survey gaging station.	1.65	39

a Made by engineers of U. S. Reclamation Service by using driftwood for floats.

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STREAM-GAGING STATIONS

AND

PUBLICATIONS RELATING TO WATER RESOURCES

PART XI PACIFIC SLOPE BASINS IN CALIFORNIA

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STREAM-GAGING STATIONS AND PUBLICATIONS RELATING TO WATER RESOURCES.

INTRODUCTION.

Investigation of water resources by the United States Geological Survey has consisted in large part of measurements of the volume of flow of streams and studies of the conditions affecting that flow, but it has comprised also investigation of such closely allied subjects as irrigation, water storage, water powers, underground waters, and quality of waters. Most of the results of these investigations have been published in the series of water-supply papers, but some have appeared in the bulletins, professional papers, and annual reports.

The results of stream-flow measurements are now published annually in 12 parts, each part covering an area whose boundaries coincide with natural drainage features as indicated below:

Part I. North Atlantic slope basins.
II. South Atlantic and eastern Gulf of Mexico basins.
III. Ohio River basin.
IV. St. Lawrence River basin.
V. Upper Mississippi River and Hudson Bay basins.
VI. Missouri River basin.
VII. Lower Mississippi River basin.
VIII. Western Gulf of Mexico basins.
IX. Colorado River basin.
X. Great Basin.
XI. Pacific slope basins in California.
XII. North Pacific slope basins.

HOW GOVERNMENT REPORTS MAY BE OBTAINED OR CONSULTED.

Water-supply papers and other publications of the United States Geological Survey containing data in regard to the water resources of the United States may be obtained or consulted as indicated below.

1. Copies may be obtained free of charge by applying to the Director of the Geological Survey, Washington, D. C. The edition printed for free distribution is, however, small and is soon exhausted.

2. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C., who will, on application, furnish lists giving prices.

3. Sets of the reports may be consulted in the libraries of the principal cities in the United States.

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4. Complete sets are available for consultation in the local offices of the water-resources branch of the Geological Survey, as follows:

Albany, N. Y., Room 18, Federal Building.
Atlanta, Ga., Post Office Building.
Boston, Mass., Customhouse.
St. Paul, Minn., Old Capitol Building.
Madison, Wis., Capitol Building.
Helena, Mont., Montana National Bank Building.
Denver, Colo., 403 New Post Office Building.
Salt Lake City, Utah, Federal Building.
Boise, Idaho, 615 Idaho Building.
Portland, Oreg., 416 Couch Building.
Tacoma, Wash., Federal Building.
San Francisco, Cal., 505 Customhouse.
Los Angeles, Cal., Federal Building.
Phoenix, Ariz., 417 Fleming Building.
Austin, Tex., Old Post Office Building.
Honolulu, Hawaii, Kapiolani Building.

A list of the Geological Survey's publications may be obtained by applying to the Director of the United States Geological Survey, Washington, D. C.

STREAM-FLOW REPORTS.

Stream-flow records have been obtained at more than 3,400 points in the United States, and the data obtained have been published in the reports tabulated below:

Stream-flow data in reports of the United States Geological Survey.

[A= Annual Report; B= Bulletin; WS= Water-Supply Paper.]

Report.	Character of data.	Year.
10th A, pt. 2	Descriptive information only	
11th A, pt. 2	Monthly discharge and descriptive information	1884 to Sept., 1890.
12th A, pt. 2	do	1884 to June 30, 1891.
13th A, pt. 3	Mean discharge in second-feet	1884 to Dec. 31, 1892.
14th A, pt. 2	Monthly discharge (long-time records, 1871 to 1893)	1888 to Dec. 31, 1893.
B 131	Descriptions, measurements, gage heights, and ratings	1893 and 1894.
16th A, pt. 2	Descriptive information only	
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	1895.
WS 11	Gage heights (also gage heights for earlier years)	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years).	1895 and 1896.
WS 15	Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas.	1897.
WS 16	Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte, and western United States.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also some long-time records).	1897.
WS 27	Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River, and Missouri River.	1898.
WS 28	Measurements, ratings, and gage heights, Arkansas River and western United States.	1898.
20th A, pt. 4	Monthly discharge (also for many earlier years)	1898.
SS 35 to 39	Descriptions, measurements, gage heights, and ratings	1899.
21st A, pt. 4	Monthly discharge	1899.
WS 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4	Monthly discharge	1900.
WS 66, 66	Descriptions, measurements, gage heights, and ratings	1901.

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Stream-flow data in reports of the United States Geological Survey—Continued.

Report.	Character of data.	Year.
WS 75	Monthly discharge	1901.
WS 82 to 85	Complete data	1902.
WS 97 to 100	do	1903.
WS 124 to 135	do	1904.
WS 165 to 178	do	1905.
WS 201 to 214	do	1906.
WS 241 to 252	do	1907–8.
WS 261 to 272	do	1909.
WS 281 to 292	do	1910.
WS 301 to 312	do	1911.
WS 321 to 332	do	1912.
WS 351 to 362	do	1913.
WS 381 to 394	do	1914.

NOTE.—No data regarding stream flow are given in the 15th and 17th annual reports.

The records at most of the stations discussed in these reports extend over a series of years, and miscellaneous measurements at many points other than regular gaging stations have been made each year. An index of the reports containing records obtained prior to 1904 has been published in Water-Supply Paper 119.

The table which follows gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1912. The data for any particular station will in general be found in the reports covering the years during which the station was maintained. For example, data for Machias River at Whitneyville, Me., 1903 to 1913, are published in Water-Supply Papers 97, 124, 165, 201, 241, 261, 281, 301, 321, 351, and 381, which contain records for the New England streams from 1903 to 1914. Results of miscellaneous measurements are published by drainage basins.

In these papers and in the following lists the stations are arranged in downstream order. The main stem of any river is determined by measuring or estimating its drainage area—that is, the headwater stream having the largest drainage area is considered the continuation of the main stream, and local changes in name and lake surface are disregarded. All stations from the source to the mouth of the main stem of the river are presented first, and the tributaries in regular order from source to mouth follow, the streams in each tributary basin being listed before those of the next basin below.

The exceptions to this rule occur in the records for Mississippi River, which are given in four parts, as indicated on page III, and in the records for large lakes, where it is simpler to take up the streams in regular order around the rim of the lake than to cross back and forth over the lake surface.

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Numbers of water-supply papers containing results of stream measurements, 1899–1914.

Year.	I North Atlantic slope (St. John River to York River).	II South Atlantic and eastern Gulf of Mexico (James River to the Mississippi).	III Ohio River.	IV St. Lawrence River and Great Lakes.	V Hudson Bay and upper Mississippi River.	VI Missouri River.	VII Lower Mississippi River.	VIII Western Gulf of Mexico.	IX Colorado River.	X Great Basin.	XI Pacific slope in California.	XII North Pacific slope basins. Pacific slope in Washington and upper Columbia River.	Snake River basin.	Lower Columbia River and Pacific slope in Oregon.
1899[a]	35	[b] 35, 36	36	36	36	[c] 36, 37	37	37	[d] 37, 38	38, [e] 39	38, [f] 39	38	38	38
1900[g]	47, [h] 48	48	48, [i] 49	49	49	49, [j] 50	50	50	50	51	51	51	51	51
1901	65, 75	65, 75	65, 75	65, 75	[k] 65, 66, 75	66, 75	[k] 65, 66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75	66, 75
1902	82	[b] 82, 83	83	[l] 82, 83	[k] 83, 85	84	[k] 83, 84	84	85	85	85	85	85	85
1903	97	[b] 97, 98	98	97	[k] 98, 99, [m] 100	99	[k] 98, 99	99	100	100	100	100	100	100
1904	[n] 124, [o] 125, [p] 126	[p] 126, 127	128	129	[k] 128, 130	130, [q] 131	[k] 128, 131	132	133	133, [r] 134	134	135	135	135
1905	[n] 165, [o] 166, [p] 167	[p] 167, 168	169	170	171	172	[k] 169, 173	174	175, [s] 177	176, [r] 177	177	178	178	[t] 177, 178
1906	[n] 201, [o] 202, [p] 203	[p] 203, 204	205	206	207	208	[k] 205, 209	210	211	212, [r] 213	213	214	214	214
1907–8	241	242	243	244	245	246	247	248	249	250, [r] 251	251	252	252	252
1909	261	262	263	264	265	266	267	268	269	270, [r] 271	271	272	272	272
1910	281	282	283	284	285	286	287	288	289	290	291	292	292	292
1911	301	302	303	304	305	306	307	308	309	310	311	312	312	312
1912	321	322	323	324	325	326	327	328	329	330	331	332A	332A	332A
1913	351	352	353	354	355	356	357	358	359	360	361	362A	362A	362A
1914	381	382	383	384	385	386	387	388	389	390	391	392	392	392

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39. Estimates for 1899 in Twenty-first Annual Report, Part IV.
[b] James River only.
[c] Gallatin River.
[d] Green and Gunnison rivers and Grand River above junction with Gunnison.
[e] Mohave River only.
[f] Kings and Kern rivers and south Pacific coast basins.
[g] Rating tables and index to Water-Supply Papers 47–52 and data on precipitation, wells, and irrigation in California and Utah contained in Water-Supply Paper 52. Estimates for 1900 in Twenty-second Annual Report, Part IV.
[h] Wissahickon and Schuylkill rivers to James River.
[i] Scioto River.
[j] Loup and Platte rivers near Columbus, Nebr., and all tributaries below junction with Platte.
[k] Tributaries of Mississippi from east.
[l] Lake Ontario and tributaries to St. Lawrence River proper.
[m] Hudson Bay only.
[n] New England rivers only.
[o] Hudson River to Delaware River, inclusive.
[p] Susquehanna River to Yadkin River, inclusive.
[q] Platte and Kansas rivers.
[r] Great Basin in California except Truckee and Carson river basins.
[s] Below junction with Gila.
[t] Rogue, Umpqua, and Siletz rivers only.

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PRINCIPAL STREAMS.

The rivers draining into the Pacific Ocean from California include San Diego, San Dieguito, San Luis Rey, Santa Ana, San Gabriel, Los Angeles, Santa Ynez, Santa Maria, and Salinas rivers, draining areas to the south of San Francisco Bay; San Joaquin River, whose chief tributaries are Kings, Merced, Tuolumne, Stanislaus, Calaveras, and Mokelumne rivers; Sacramento River, whose principal tributaries are Pit, Feather, and American rivers; and Russian, Eel, Mad, Klamath, and Smith rivers, which flow into the ocean north of San Francisco Bay. Except Klamath River, which receives the drainage from a small area in Oregon, and a few streams in Oregon that flow into Goose Lake, at the head of Pit River, all the streams in this division are entirely in California.

In addition to the list of gaging stations and the annotated list of publications relating specifically to the section, these pages contain a similar list of reports that are of general interest in many sections and cover a wide range of hydrologic subjects, and also brief refer ences to reports published by State and other organizations. (See p. xxi.)

GAGING STATIONS.

NOTE.—Dash following a date indicates that the station was being maintained September 30, 1914; period after date indicates discontinuance.

DRAINAGE BASINS SOUTH OF SAN FRANCISCO BAY.

Tia Juana River:
- Cottonwood Creek near Dulzura, Cal., 1905–
  - Dulzura Conduit near Dulzura, Cal., 1909–
  - Pine Valley Creek near Jamul, Cal., 1906–1908.

Sweetwater River near Descanso, Cal., 1905–
Sweetwater River near Dehesa, Cal., 1913–
San Diego River at diverting dam near Lakeside, Cal., 1912–
San Diego River at Lakeside, Cal., 1905–
San Diego River near Santee, Cal., 1912–
San Diego River at San Diego, Cal., 1912–
- Boulder Creek at Cuyamaca reservoir near Julian, Cal., 1912–
- Boulder Creek at mouth near Lakeside, Cal., 1912–
- San Diego flume at diverting dam near Lakeside, Cal., 1913–
- San Diego flume near Lakeside, Cal., 1907–
- South Fork of San Diego River near Alpine, Cal., 1913–
- South Fork flume near Alpine, Cal., 1913–

Santa Ysabel Creek (head of San Dieguito River) near Santa Ysabel, Cal., 1913–14.
Santa Ysabel Creek near Mesa Grande, Cal., 1912–
Santa Ysabel Creek near Ramona, Cal., 1912–
Santa Ysabel Creek near Escondido, Cal., 1905–1912.
San Dieguito River at Bernardo, Cal., 1912–
San Dieguito River near Del Mar, Cal., 1913–14.
- Black Canyon Creek near Mesa Grande, Cal., 1913–
- Temescal Creek near Almond, Cal., 1913–
- East San Pasqual ditch near Escondido, Cal., 1912–1914.
- West San Pasqual ditch near Escondido, Cal., 1912–
- Santa Maria Creek near Ramona, Cal., 1912–

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San Luis Rey River near Warner Springs, Cal., 1913–
San Luis Rey River near Mesa Grande, Cal., 1911–
San Luis Rey River at diversion flume, 1894–1899.
San Luis Rey River near Pala, Cal., 1903–
San Luis Rey River at Pala, Cal., 1912.
San Luis Rey River at Bonsall, Cal., 1912–
San Luis Rey River near Oceanside, Cal., 1912–1914.
Agua Caliente Creek near Warner Springs, Cal., 1913–
Canada Verde Creek near Warner Springs, Cal., 1913–
West Fork of San Luis Rey River near Warner Springs, Cal., 1913–
Carrizo Creek near Warner Springs, Cal., 1913–
Susanna Creek near Warner Springs, Cal., 1913–
Matagual Creek near Warner Springs, Cal., 1912–
Escondido Mutual Water Co.'s canal near Nellie, Cal., 1905–1912.
Rincon Indian Reservation ditch near Valley Center, Cal., 1912.
Pala Indian Reservation canal at Pala, Cal., 1912–13.
San Luis Rey ditch near San Luis Rey, Cal., 1913.
Temecula Creek (head of Santa Margarita River) near Temecula, Cal., 1905–6.
Santa Ana River near Mentone, Cal., 1896–
Pacific Light & Power Corporation's canal and Greenspot pipe line near Mentone, Cal., 1896–
Highlands or North Fork canal at intake weir, San Bernardino County, Cal., 1896–1904.
Redlands or South Fork canal at sand box weir, San Bernardino County, Cal., 1896–1904.
Mill Creek in canyon near headworks of Crafton canal, Cal., 1896–1905.
Mill Creek at Forest Home, Cal., 1903–
Waterman Canyon Creek near San Bernardino, Cal., 1911–1914.
Devil Canyon Creek near San Bernardino, Cal., 1911–1914.
Lytle Creek at mouth of canyon near San Bernardino, Cal., 1894–1901; 1904–
Temescal Creek near Rincon, Cal., 1899.
Coldwater Creek above dam, Riverside County, Cal., 1899.
San Antonio Creek near Upland, Cal., 1901–
San Gabriel River above Fish Fork, near Azusa, Cal., 1900–1901; 1910; 1912. (Low-water records.)
San Gabriel River at headworks near Azusa, Cal., 1912–1914.
San Gabriel River near Azusa, Cal., 1895–
Pacific Light & Power Corporation's canal near Azusa, Cal., 1896–
West Branch of North Fork of San Gabriel River at weir, 1900.
North Branch of North Fork of San Gabriel River at weir, 1900.
West Fork of San Gabriel River above North Fork, Cal., 1900.
Coldwater Creek at weir above mouth, 1900.
Fish Fork of San Gabriel River near Azusa, Cal., 1900–1901; 1910; 1912. (Low-water record.)
Iron Fork of San Gabriel River near Azusa, Cal., 1900–1901; 1910; 1912. (Low-water record.)
Los Angeles River at Los Angeles, Cal., 1896–1900.
Arroyo Seco near Pasadena, Cal., 1910–
Malibu Creek near Calabasas, Cal., 1903–1906.
Triunfo Creek near Calabasas, Cal., 1903–1906.
Santa Clara River at Fillmore, Cal., 1911–12.
Piru Creek near Piru, Cal., 1911–1913.
Sespe Creek at Sespe, Cal., 1911–1913.
Santa Paula Creek near Santa Paula, Cal., 1911–1913.

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Ventura River near Nordhoff, Cal., 1911–1914.
Ventura River near Ventura, Cal., 1911–1914.
San Roqui Creek, Santa Barbara County, Cal., 1890.
San Jose Creek, Santa Barbara County, Cal., 1890.
Loma Abajo River, Santa Barbara County, Cal., 1890.
Gato Creek at mouth, Santa Barbara County, Cal., 1890.
Santa Ynez River near Santa Barbara, Cal., 1903–1908; 1910–
Santa Ynez River near Lompoc, Cal., 1906–
Mono Creek at Mono dam site near Santa Barbara, Cal., 1902–1904.
Santa Maria River near Santa Maria, Cal., 1903–1906.
Salinas River near Salinas, Cal., 1900–1901.
Nacimiento Creek near Bryson, Cal., 1901.
San Antonio River near Jolon, Cal., 1900–1901.
San Lorenzo Creek near King City, Cal., 1900–1903, 1912.
Arroyo Seco near Soledad, Cal., 1901–
Pajaro River at Watsonville, Cal., 1911–1914.

SAN FRANCISCO BAY.

MINOR STREAMS.

Coyote River near Madrone, Cal., 1902–1912.
Alameda Creek at Sunolglen, Cal., 1900–
Spring Valley aqueduct near Sunolglen, Cal., 1903–

KERN RIVER BASIN.

Kern River near Kernville, Cal., 1912–
Kern River at Kernville, Cal., 1905–1912.
Kern River at Isabella, Cal., 1910–1912.
Kern River at Rio Bravo ranch, Cal., 1878–1884.
Kern River near Bakersfield, Cal., 1894–
Kern River Power Co.'s canal at Kernville, Cal., 1910–1914.
South Fork of Kern River near Onyx, Cal., 1911–1914.
South Fork of Kern River at Isabella, Cal., 1910–1913.
Erskine Creek near Bodfish, Cal., 1911–
Caliente Creek at base of foothills, Kern County, Cal., 1878–1884.
Basin Creek near Havilah, Cal., 1911–1913.
Tejon House Creek at Tejon ranch house, Cal., 1895–96.
San Emigdio Creek at San Emigdio ranch house, Cal., 1894–95.

TULARE LAKE BASIN.

Poso Creek at base of foothills, Kern County, Cal., 1878–1884.
White River at base of foothills, Tulare County, Cal., 1878–1884.
White River near Hot Springs, Cal., 1911–1913.
Deer Creek at base of foothills, Tulare County, Cal., 1878–1884.
Deer Creek at Hot Springs, Cal., 1910–
Tyler Creek near Hot Springs, Cal., 1911–1913.
Tule River, North Fork of Middle Fork, near Springville, Cal., 1909–1913.
Tule River near Portersville, Cal., 1901–
Tule River at Portersville, Cal., 1878–1884.
South Fork of Middle Fork of Tule River near Springville, Cal., 1909–1913.
Bear Creek near Springville, Cal., 1911–
South Fork of Tule River near Portersville, Cal., 1910–
Kaweah River, Middle Fork, near Hammond, Cal., 1913.
Kaweah River at Wachumna Hill, Cal., 1878–1884.

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Kaweah River near Three Rivers, Cal., 1911–
Marble Fork of Kaweah River near Ranger, Cal., 1913.
East Fork of Kaweah River near Hammond, Cal., 1913.
North Fork of Kaweah River near Kaweah, Cal., 1913.
North Fork of Kaweah River at Kaweah, Cal., 1910–
South Fork of Kaweah River near Three Rivers, Cal., 1911–
Kings River at Suspension Bridge, Cal., 1895.
Kings River near Sanger, Cal., 1895–
Kings River at Slate Point, Cal., 1878–1884.
Kings River at Kingsburg, Cal., 1891–1904.
Dinkey Creek near Ockenden, Cal., 1910–
Big Creek near Tollhouse, Cal., 1911–1914.
Rush Creek near Ockenden, Cal., 1910–1913.

SAN JOAQUIN RIVER BASIN.

San Joaquin River near Shaver, Cal., 1912–
San Joaquin River near North Fork, Cal., 1910–
San Joaquin River near Friant, Cal., 1907–
San Joaquin River near Hamptonville, Cal., 1878–1884.
San Joaquin River at Herndon, Cal., 1891–1909.
San Joaquin River near Newman, Cal., 1912–
Big Creek near Shaver, Cal., 1910–
Pitman Creek near Shaver, Cal., 1910–
North Fork Creek near North Fork, Cal., 1910–11.
Crane Valley reservoir near North Fork, Cal., 1910–
South Fork Creek near North Fork, Cal., 1910–
South Fork ditch near North Fork, Cal., 1910; 1913.
Whiskey Creek near North Fork, Cal., 1910–
Cascadel Creek near North Fork, Cal., 1910–1912.
Fresno River at base of foothills, Madera County, Cal., 1878–1884.
Fresno River near Knowles, Cal., 1911–
Nelder Creek near Fresno Flats, 1910–1912.
North Fork of Fresno River near Sugar Pine, Cal., 1910–1912.
Chowchilla Creek at base of foothills, near Buchanan, Cal., 1878–1884.
Mariposa Creek at base of foothills, Mariposa County, Cal., 1878–1884.
Bear Creek at base of foothills, Merced County, Cal., 1878–1884.
Merced River at Yosemite, Cal., 1904–1909; 1912–
Merced River near Merced Falls, Cal., 1901–1913.
Merced River at Merced Falls, Cal., 1878–1884.
Merced River near Newman, Cal., 1912.
Tenaya Creek near Yosemite, Cal., 1904–1909; 1912–
Yosemite Creek at Yosemite, Cal., 1904–1909; 1912–
South Fork of Merced River at Wawona, Cal., 1910–
Big Creek near Wawona, Cal., 1910–11.
Tuolumne River at Hetch Hetchy cabin near Sequoia, Cal., 1910–
Tuolumne River at Hetch Hetchy dam site near Sequoia, Cal., 1901; 1910–
Tuolumne River near La Grange, Cal., 1895–
Tuolumne River near Groveland, Cal., 1907–
Tuolumne River at Modesto, Cal., 1878–1884; 1891–1897.
Cherry Creek near Sequoia, Cal., 1901; 1910–
Eleanor Creek near Sequoia, Cal., 1901; 1909–
Jawbone Creek near Tuolumne, Cal., 1910–

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San Joaquin River tributaries—Continued.
Tuolumne River tributaries—Continued.
Corral Creek near Groveland, Cal., 1910–1913.
South Fork of Tuolumne River near Sequoia, Cal., 1914–
Golden Rock ditch near Sequoia, Cal., 1914–
South Fork of Tuolumne River near Groveland, Cal., 1910–
Clavey River near Tuolumne, Cal., 1910–1913.
Indian Creek near Tuolumne, Cal., 1910–11.
North Fork of Tuolumne River near Tuolumne, Cal., 1910–11.
Hunter Creek near Tuolumne, Cal., 1910–1913.
Yosemite Water & Power Co.'s canal near La Grange, Cal., 1908–
Modesto Canal near La Grange, Cal., 1903–
Turlock Canal near La Grange, Cal., 1899–
Stanislaus River, Middle Fork, at Sand Bar Flat, near Avery, Cal., 1905–
Stanislaus River at Knights Ferry, Cal., 1903–
Stanislaus River at Oakdale, Cal., 1878–1884; 1895–1900.
Relief reservoir near Baker Station, Cal., 1910–
Relief Creek near Baker Station, Cal., 1910–
North Fork of Stanislaus River near Avery, Cal., 1914–
Utica Gold Mining Co.'s canal near Avery, Cal., 1914–
Rose Creek near Jupiter, Cal., 1910–1913.
Knight Creek near Jupiter, Cal., 1910–1913.
South Fork of Stanislaus River near Strawberry, Cal., 1911–
South Fork of Stanislaus River near Columbia, Cal., 1910–1913.
South San Joaquin Canal near Knights Ferry, Cal., 1914–
Oakdale canal near Knights Ferry, Cal., 1914–
Stanislaus & San Joaquin Water Co.'s canal at Knights Ferry, Cal., 1904–1913.
Calaveras River at Jenny Lind, Cal., 1907–
Calaveras River near Bellota, Cal., 1878–1884.
Mokelumne River at Electra, Cal., 1901; 1903–4.
Mokelumne River at Lone Star Mill, Cal., 1878–1884.
Mokelumne River near Clements, Cal., 1904–
Mokelumne River at Lodi, Cal., 1891–1895.
Middle Fork of Mokelumne River at West Point, Cal., 1911–
South Fork of Mokelumne River near Railroad Flat, Cal., 1911–
Licking Fork of Mokelumne River near Railroad Flat, Cal., 1911–
Dry Creek near Ione, Cal., 1911–12.
Dry Creek at base of foothills, San Joaquin County, Cal., 1878–1884.
Cosumnes River, North Fork, near Pleasant Valley, Cal., 1906–7.
Cosumnes River, North Fork, near Eldorado, Cal., 1911–
Cosumnes River at Michigan Bar, Cal., 1907–
Cosumnes River below Michigan Bar, Cal., 1878–1884.
Sly Park Creek at Park, Cal., 1906.

GOOSE LAKE BASIN.

Drews Creek reservoir near Lakeview, Oreg., 1913–
Drews Creek near Lakeview, Oreg., 1909–
Dog Creek near Lakeview, Oreg., 1912–13.
North Drews canal near Lakeview, Oreg., 1914–
Cottonwood Creek near Lakeview, Oreg., 1908–
Thomas Creek near Lakeview, Oreg., 1912–

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SACRAMENTO RIVER BASIN.

Sacramento River at Castella, Cal., 1910–
Sacramento River at Antler, Cal., 1910–11.
Sacramento River at Jellys Ferry, Cal., 1895–1902.
Sacramento River near Red Bluff, Cal., 1902–
Sacramento River at Red Bluff, Cal., 1894–1896.
Sacramento River at Collinsville, Cal., 1878–1885.
Pit River near Canby, Cal., 1904–5.
Pit River near Bieber, Cal., 1904–1908; 1913–14.
Pit River at Henderson, Cal., 1910–
Pit River near Ydalpom, Cal., 1910–
South Fork of Pit River near Ivy, Cal., 1904–5.
West Valley Creek near Likely, Cal., 1904–5.
Ash Creek at Adin, Cal., 1904–5.
Fall River at Fall River Mills, Cal., 1912–13.
Hat Creek at Hawkin's ranch, near Hat Creek, Cal., 1911–1913.
Hat Creek at Hat Creek, Cal., 1910–
Rising River near Cassel, Cal., 1911–1914.
Burney Creek near Burney, Cal., 1911–1913.
Kosk Creek near Henderson, Cal., 1910–
Montgomery Creek at Montgomery Creek, Cal., 1911–1913.
Squaw Creek near Ydalpom, Cal., 1911–1913.
McCloud River near Gregory, Cal., 1902–1908.
McCloud River at Baird, Cal., 1910–
Clear Creek near Shasta, Cal., 1911–1913.
Cow Creek at Millville, Cal., 1911–1914.
Clover Creek at Millville, Cal., 1911–1914.
Little Cow Creek at Palo Cedro, Cal., 1911–1914.
Bear Creek near Millville, Cal., 1911–1914.
North Fork of Cottonwood Creek at Ono, Cal., 1907–1914.
Mill Creek near Los Molinos, Cal., 1909–1913.
Deer Creek near Vina, Cal., 1911–
Stony Creek near Fruto, Cal., 1901–1912.
Little Stony Creek near Lodoga, Cal., 1907–
Feather River, North Fork, above Prattville, Cal., 1905–1907.
Feather River, North Fork, near Prattville, Cal., 1905–
Feather River, North Fork, at Big Bar, Cal., 1911–
Feather River, North Fork, at Big Bend, Cal., 1905–1910.
Feather River at Oroville, Cal., 1902–
Hamilton Branch near Prattville, Cal., 1905–1907.
Butt Creek at Butte Valley, Cal., 1905–
Indian Creek near Crescent Mills, Cal., 1906–1909; 1911–
Spanish Creek at Keddie, Cal., 1911–
Middle Fork of Feather River at Cromberg, Cal., 1910–
Middle Fork of Feather River near Oroville, Cal., 1911–
Grizzly Creek near Beckwith, Cal., 1905–6.
South Fork of Feather River at Enterprise, Cal., 1911–
Palermo Land & Water Co.'s canal at Enterprise, Cal., 1911–
Yuba River, Middle Fork, near North San Juan, Cal., 1900; 1910–
Yuba River near Smartsville, Cal., 1903–
Yuba River at Parks Bar bridge, near Smartsville, Cal., 1900.
Oregon Creek near North San Juan, Cal., 1910–
North Fork of Yuba River near Sierra City, Cal., 1911–1913.

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Sacramento River tributaries—Continued.
Feather River tributaries—Continued.
Yuba River tributaries—Continued.
North Fork of Yuba River at Goodyear Bar, Cal., 1910–
North Fork of Yuba River near North San Juan, Cal., 1900.
North Fork of North Fork of Yuba River at Downieville, Cal., 1910–
Rock Creek at Goodyear Bar, Cal., 1910–
Goodyear Creek at Goodyear Bar, Cal., 1910–
Bear River near Colfax, Cal., 1911–
Bear River at Van Trent, Cal., 1904–
Bear River canal near Colfax, Cal., 1911–
American River, North Fork, near Colfax, Cal., 1911–
American River at Fairoaks, Cal., 1904–
Middle Fork of American River near East Auburn, Cal., 1911–
Rubicon River at Rubicon Springs, Cal., 1910–1914.
Rubicon River near Quintette, Cal., 1909–1914.
Little Rubicon River near Rubicon Springs, Cal., 1910–11.
Little South Fork of Rubicon River at sawmill near Quintette, Cal., 1910–1914.
Little South Fork of Rubicon River below Gerle Creek near Quintette, Cal., 1910–1914.
Little South Fork of Rubicon River at mouth near Quintette, Cal., 1909–1911.
Gerle Creek near Rubicon Springs, Cal., 1910–1914.
Little South Fork ditch at sawmill near Quintette, Cal., 1910–1913.
Pilot Creek near Quintette, Cal., 1910–1914.
Pilot Creek ditch near Quintette, Cal., 1910–1914.
South Fork of American River at Kyburz, Cal., 1906–7.
South Fork of American River near Kyburz, Cal., 1906.
South Fork of American River below Kyburz, Cal., 1907.
South Fork of American River near Placerville, Cal., 1911–
Clear Lake in Lake County, Cal., 1874–1900; 1913–
Cache Creek at Lower Lake, Cal., 1901–
Cache Creek at Yolo, Cal., 1903–
Putah Creek near Guenoc, Cal., 1904–1906.
Putah Creek at Winters, Cal., 1905–

DRAINAGE BASINS NORTH OF SAN FRANCISCO BAY.

RUSSIAN RIVER BASIN.

Russian River near Ukiah, Cal., 1911–1913.
Russian River at Geyserville, Cal., 1910–1913.
East Fork of Russian River near Ukiah, Cal., 1911–1913.

MATTOLE RIVER BASIN.

Mattole River near Petrolia, Cal., 1911–1913.

EEL RIVER BASIN.

South Eel River at Hearst, Cal., 1910–1913.
Eel River at Two Rivers, Cal., 1911–1913.
Eel River at Scotia, Cal., 1910–
Middle Eel River near Covelo, Cal., 1911–
South Fork of Eel River at Garberville, Cal., 1911–1913.
Van Duzen River at Bridgeville, Cal., 1911–1913.
Yager Creek at Carlotta, Cal., 1911–1914.

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MAD RIVER BASIN.

Mad River near Arcata, Cal., 1910–1913.

REDWOOD CREEK BASIN.

Redwood Creek near Korbel, Cal., 1911–1913.
Redwood Creek at Orick, Cal., 1911–1913.

KLAMATH RIVER BASIN.

Williamson River (head of Klamath River) above Spring Creek, near Chiloquin, Oreg. 1908–1910; 1912–13.
Williamson River at Chiloquin, Oreg., 1911–
Upper Klamath Lake near Klamath Falls, Oreg., 1904; 1906–
Link River at Klamath Falls, Oreg., 1904–
Lower Klamath Lake near Brownell, Cal., 1907–1909; 1912–
Klamath River below Klamath Falls, Oreg., 1907–1909.
Klamath River at Keno, Oreg., 1904–1913.
Klamath River near Seiad Valley, Cal., 1912–
Klamath River near Happy Camp, Cal., 1911–12.
Klamath River near Requa, Cal., 1910–
Miller Creek near Crescent, Oreg., 1911–1914.
Sprague River near (above) Yainax, Oreg., 1912–
Sprague River near (below) Yainax, Oreg., 1904.
Sprague River at Chiloquin, Oreg., 1911–
Sycan River near Silverlake, Oreg., 1905–6.
Sycan River near Yainax, Oreg., 1911–
Wood River at Fort Klamath, Oreg., 1911–
Anna Creek at Crater Lake post office, Oreg., 1913.
Fourmile Creek near Odessa, Oreg., 1912–
"A" canal at Klamath Falls, Oreg., 1911–
Lost River near Clear Lake, Cal., 1904–1909.
Lost River at Olene, Oreg., 1904; 1907–1912.
Lost River at Wilson Bridge near Olene, Oreg., 1912–
Lost River near Merrill, Oreg., 1904–1909.
Lost River diversion canal near Olene, Oreg., 1912–
Tule Lake near Merrill, Oreg., 1904–
Miller Creek near Lorella, Oreg., 1909–
Griffith lateral at Lost River dam near Olene, Oreg., 1913–
Shasta River near Montague, Cal., 1911–1913.
Scott River, East Fork, near Callahan, Cal., 1910–1913.
Scott River, East Fork, at Callahan, Cal., 1913–
Scott River at Callahan, Cal., 1911–
Scott River near Scott Bar, Cal., 1911–1913.
Indian Creek near Happy Camp, Cal., 1911–
Reeve Davis flume near Happy Camp, Cal., 1911–1913.
Salmon River at Somesbar, Cal., 1911–
Trinity River near Trinity Center, Cal., 1910–1913.
Trinity River at Lewiston, Cal., 1911–
Trinity River near China Flat, Cal., 1911–
Trinity River at Hoopa, Cal., 1911–
Coffee Creek at Coffee, Cal., 1910–
East Fork of Trinity River near Trinity Center, Cal., 1910–1914.
Swift Creek near Trinity Center, Cal., 1910–1914.
North Fork of Trinity River at Helena, Cal., 1911–1914.
South Fork of Trinity River near China Flat., Cal., 1911–1913.

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SMITH RIVER BASIN.

Smith River, Middle Fork, near Crescent City, Cal., 1911–
North Fork of Smith River near Crescent City, Cal., 1911–
South Fork of Smith River near Crescent City, Cal., 1911–1913.

REPORTS ON WATER RESOURCES OF THE PACIFIC SLOPE OF CALIFORNIA.

PUBLICATIONS OF UNITED STATES GEOLOGICAL SURVEY.

WATER-SUPPLY PAPERS.

*17. Irrigation near Bakersfield, Cal., by C. E. Grunsky. 1898. 96 pp., 16 pls.

*18. Irrigation near Fresno, Cal., by C. E. Grunsky. 1898. 94 pp., 14 pls. 10c.

*19. Irrigation near Merced, Cal., by C. E. Grunsky. 1899. 59 pp., 11 pls. 15c.

Water-Supply Papers 17, 18, and 19 discuss the development of irrigation in the San Joaquin Valley, outline physiographic features, and give history of the various irrigation districts. Chiefly of historic interest as indicated by dates of publication.

*43. Conveyance of water in irrigation canals, flumes, and pipes, by Samuel Fortier. 1901. 86 pp., 15 pls. 15c.

Describes the location and construction of various types of canals for irrigation.

*45. Water storage on Cache Creek, Cal., by A. E. Chandler. 1901. 48 pp., 10 pls. 15c.

Discusses topography, precipitation, stream measurements, underground waters, and irrigation works in Cache Creek basin; includes description of Clear Lake.

46. Physical characteristics of Kern River, Cal., by F. H. Olmsted, and reconnaissance of Yuba River, Cal., by Marsden Manson. 1901. 57 pp., 8 pls. 10c.

Describes topography of Kern River basin, gives estimates of daily and monthly discharge, and discusses possible utilization of storage sites and development of power. The second paper in the report gives similar data for Yuba River.

57. Preliminary list of deep borings in the United States, Part I (Alabama-Montana), by N. H. Darton. 1902. 60 pp. (See No. 149.) 5c.

Contains information as to depth, diameter, yield, and head of water in borings more than 400 feet deep; under head "Remarks" gives information concerning temperature, quality of water, purposes of boring, etc.

*58. Storage of water on Kings River, Cal., by J. B. Lippincott. 1902. 101 pp., 32 pls. 15c.

Discusses physical features, rainfall, stream flow, evaporation and seepage and power development; includes chapter (by Lewis A. Hicks) on the generation and transmission of electric power and installation of pumping plants.

*59. Development and application of water near San Bernardino, Colton, and Riverside, Cal., Part I, by J. B. Lippincott. 1902. 95 pp., 11 pls.

*60. Development and application of water near San Bernardino, Colton, and Riverside, Cal., Part II, by J. B. Lippincott. 1902. 96–141 pp. 15c.

Nos. 59 and 60 describe topography, soil, climate, crops, canals, wells, and pumping plants; discuss briefly the manufacture of Portland cement in southern California.

*81. California hydrography, by J. B. Lippincott. 1903. 488 pp., 1 pl. 25c.

A collection of published records of stream flow "hitherto much scattered, some of them out of print and difficult to secure," brought together as a book of reference for engineers and irrigators.

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86. Storage reservoirs on Stony Creek, Cal., by Burt Cole. 1903. 62 pp., 16 pls. 15c.

Discusses briefly water supply of Glenn County, as related to population, industry, irrigation districts, the proposed Stony Creek Forest Reserve, and storage sites on Grindstone, Salt, Briscoe, and Stony creeks.

89. Water resources of the Salinas Valley, Cal., by Homer Hamlin. 1904. 91 pp., 12 pls. 15c.

Describes briefly the geography, topography, general and economic geology, climate, water supply, and irrigation of the Salinas Valley.

*112. Underflow tests in the drainage basin of Los Angeles River, by Homer Hamlin. 1905. 55 pp., 7 pls. 5c.

Discusses conditions under which ground water occurs in arid regions, and fluctuations in water level; describes machinery and methods used in sinking test wells and the results obtained at each station.

116. Water problems of Santa Barbara, Cal., by J. B. Lippincott. 1905. 99 pp., 8 pls. 10c.

Reviews earlier work in Santa Barbara region and describes near-by and distant water supplies, including Ventura and Santa Ynez rivers; discusses the quality of the water of the Santa Ynez (giving analyses) and the available reservoir sites.

*137. Developmemt of underground waters in the eastern coastal-plain region of southern California, by W. C. Mendenhall. 1905. 140 pp., 7 pls. 35c.

*138. Development of underground waters in the central coastal-plain region of southern California, by W. C. Mendenhall. 1905. 162 pp., 5 pls. 25c.

*139. Development of underground waters in the western coastal-plain region of southern California, by W. C. Mendenhall. 1905. 105 pp., 8 pls. 25c.

Three reports discussing the topography, crops, irrigation systems, and wells, and the effects of development and drought on changes in ground-water level. The area covered by these reports includes the Anaheim, Santa Ana, Downey, Las Bolsas, Santa Monica, and Redondo quadrangles in Orange and Los Angeles counties.

140. Field measurements of the rate of movement of underground waters, by C. S. Slichter. 1905. 122 pp., 15 pls. 15c.

Contains chapters on measurements of underflow of Rio Hondo and San Gabriel River and at the Narrows of Mohave River.

*142. The hydrology of San Bernardino Valley, Cal., by W. C. Mendenhall. 1905. 124 pp., 12 pls. 25c.

Discusses rainfall, soils, artesian areas, temperature, and chemical character of the ground waters, gives tables of flow of Santa Ana River, Mill Creek, and other streams, and lists of wells in Redlands and San Bernardino quadrangles.

146. Proceedings of second conference of engineers of the Reclamation Service, with accompanying papers, compiled by F. H. Newell, chief engineer. 1905. 267 pp. 15c. [Inquiries concerning this report should be addressed to the Reclamation Service.] Contains:

A brief account of the organization of the hydrographic (water resources) branch and the Reclamation Service, reports of conferences and committees, circulars of instruction, and many brief reports on subjects closely related to reclamation, and a bibliography of technical papers by members of the service.

A report on "Underground waters of southern California," by W. C. Mendenhall. Gives an account of early irrigation by use of surface waters, the development of artesian wells for irrigation, and discusses the origin, distribution, and character of the artesian waters, the causes of fluctuations in the supply, and the need of moderation in use.

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146. Proceedings of second conference of engineers of the Reclamation Service—Continued.

A report on the Klamath project, by J. B. Lippincott. Describes Klamath River and its principal tributaries and Lost River and Tule Lake. Describes also the irrigable lands in Butte Valley and around Tule and Lower Klamath lakes and in the Klamath Indian Reservation.

A brief report on "Pumping underground water in southern California," by F. C. Finkle. Discusses underground reservoirs, the source, extent, and methods of replenishment of the water supply, and describes the efficiency of pumps and the development of electric power for pumping.

147. Destructive floods in the United States in 1904, by E. C. Murphy and others 1905. 206 pp., 18 pls. 15c. Contains:

Sacramento River flood, California, from report of S. G. Bennett. Gives accounts of flood on Sacramento River; describes briefly the streams of the basin, precipitation, discharge, damages, and prevention of future losses.

149. Preliminary list of deep borings in the United States, second edition, with additions, by N. H. Darton. 1905. 175 pp. 10c.

Gives by States (and within the States by counties), location, depth, diameter, yield, height of water, and other valuable information concerning wells 400 feet or more in depth; includes all wells listed in Water-Supply Papers 57 and 61; mentions also principal publications relating to deep borings.

*162. Destructive floods in the United States in 1905, with a discussion of flood discharge and frequency and an index to flood literature by E. C. Murphy and others. 1906. 105 pp., 4 pls. 15c.

Gives estimates of flood flow and frequency (p. 85) for Tuolumne River at La Grange, Kern River at Rio Bravo ranch, and Kings River at Sanger; contains also index to literature on floods in American streams.

*213. The surface water supply of California, 1906, by W. B. Clapp, with a section on groundwater levels in southern California, by W. C. Mendenhall. 1907. 219 pp., 4 pls. 25c.

Contains the results of a series of measurements of the fluctuation of ground-water levels made during 1904, 1905, and 1906. The wells were "so selected that they would be evenly distributed over the various basins which together make up the lowland areas of southern California, and would thus give an adequate basis for conclusions as to conditions in each of these basins."

*219. Ground waters and irrigation enterprises in the foothill belt, southern California, by W. C. Mendenhall. 1908. 180 pp., 9 pls. 50c.

Describes the general geologic conditions, physical features, rainfall, storage facilities, character and condition of subterranean reservoirs, measures for conservation of waters, and the ground waters by districts; discusses fluctuation in ground-water levels and gives results of measurements; describes irrigation enterprises and systems and gives statistics of wells.

*220. Geology and water resources of a portion of south-central Oregon, by G. A. Waring. 1908. 86 pp., 10 pls. 20c.

Describes the rocks, streams, lakes, and lake valleys, deep and shallow wells, climate, soils, vegetation, industries, and reclamation projects in Lake County; gives analyses of soils and waters. The greater part of the area described is considered part of the Great Basin, but the streams of a small area in the southern part are tributary to Goose Lake, which within historic times has overflowed southward to Pit River, a tributary of the Sacramento.

*222. Preliminary report on the ground waters of San Joaquin Valley, Cal., by W. C. Mendenhall. 1908. 52 pp., 1 pl. 10c.

Describes the geography of the valley, the rocks, soils, surface waters, and the origin, circulation, quantity, accessibility, and development of the underground waters; gives notes on water supply by counties.

237. The quality of the surface waters of California, by Walton Van Winkle and F. M. Eaton. 1910. 142 pp., 1 pl. 20c.

Describes geography, climate, industrial development, and drainage, and gives results of mineral analyses of the river waters.

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251. Surface water supply of the United States, 1907–8, Part XI. California, by W. B. Clapp and W. F. Martin. 1910. 363 pp., 7 pls. 35c.

Contains a section (pp. 338–348) on "fluctuations in ground-water levels in the valley of southern California." The measurements here published form a continuation of those published in Water-Supply Paper 213. They were made at irregular intervals during 1907–8 on the same wells that were measured during the earlier period, except for a few wells that had become inaccessible.

274. Some stream waters of the western United States, with chapters on sediment carried by the Rio Grande and the industrial application of water analyses, by Herman Stabler. 1911. 188 pp. 15c.

Describes collection of samples, plan of analytical work, and methods of analyses; discusses soap-consuming power of waters, water softening, boiler waters, and water for irrigation; gives results of analyses of waters of Sacramento, Pit, Feather, Yuba, and American Rivers, Stony and Putah Creeks, and Tuolumne River; also of Link River, Oreg., in Klamath River basin.

295. Gazetteer of surface waters of California, Part I, Sacramento River basin, by B. D. Wood. 1912. 99 pp. 10c.

296. Gazetteer of surface waters of California, Part II, San Joaquin River basin, by B. D. Wood. 1912. 102 pp. 10c.

297. Gazetteer of surface waters of California, Part III, Pacific coast and Great Basin streams, by B. D. Wood. 1913. 244 pp. 20c.

Nos. 295–297 embrace descriptions of streams and lakes named on best available maps of California.

298. Water resources of California, Part I, Stream measurements in Sacramento River basin, by H. D. McGlashan and F. F. Henshaw. 1912. 411 pp., 8 pls. 30c.

299. Water resources of California, Part II, Stream measurements in San Joaquin River basin, by H. D. McGlashan and H. J. Dean. 1912. 439 pp., 7 pls. 50c.

*300. Water resources of California, Part III, Stream measurements in the Great Basin and Pacific coast river basins, by H. D. McGlashan and H. J. Dean. 1913. 956 pp., 4 pls. 55c.

Nos. 298–300 comprise all data concerning stream flow in California available up to September 30, 1912. The reports describe the drainage basins, precipitation, temperature, and forests, and give the results of work at gaging stations. See also Nos. 295–297.

338. Springs of California, by Gerald A. Waring. 1915. 410 pp., 13 pls. 60c.

Describes briefly the physical features of California, including the coast ranges, Great Central Valley, the lava-covered region, the Sierra Nevada, the southeastern desert, and faults; defines "mineral water" and "pure water"; discusses source and amount of substances in waters, degree of concentration of natural waters and their properties, and the therapeutic value, temperature, and classification of mineral waters. The springs are described under the headings "hot," "carbonated," "sulphur," "saline," "magnesic," "iron," "artesian," "large cold," and "minor perennial" springs.

*345. Contributions to the hydrology of the United States, 1914; N. C. Grover, chief hydraulic engineer. 1915. 225 pp., 17 pls. 30c. Contains:

(*h*) Ground-water resources of the Niles cone and adjacent areas, California, by W. O. Clark. Describes an area just east of the south end of San Francisco Bay. The investigation on which the report is based was made "to determine the source of the ground water, the quantity now being withdrawn, the amount available, and the area dependent on Alameda Creek." Describes the physiography and drainage of mountain and valley areas; gives records of precipitation in Alameda and Santa Clara Counties and of the monthly discharge of Alameda Creek; discusses the source of the ground waters, the effect of the Niles-Irvington fault, contributions to the ground-water supply, relation of withdrawals to contributions, and gives a summary of conclusions.

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. Quality of the surface waters of Oregon, by W. Van Winkle. 1914. 137 pp., 2pls. 20c.

Among the drainage basins described is Goose Lake, which has within historic times discharged southward to Pit River, a tributary of the Sacramento, and Klamath River, which enters the Pacific in northern California.

. Contributions to the hydrology of the United States, 1915; Nathan C. Grover, chief hydraulic engineer. 1916. 181 pp., 9 pls. Contains:

(a) Ground water for irrigation in the Sacramento Valley, Cal., by Kirk Bryan. Describes the geography and the geology of the valley and the origin and the movements of the ground water, and discusses problems relating to wells and to pumping; gives a brief account of the progress of irrigation with well water.

Ground water in San Joaquin Valley, Cal., by W. C. Mendenhall, R. B. Dole, and Herman Stabler. 1916. 310 pp., 5 pls.

Describes the geography of the valley and gives the geologic outline of the rocks of the border and the origin of the present surface; describes the occurrence and utilization of ground water, the chemical composition of surface and ground waters, and gives notes by counties. Contains 61 tables, most of which relate to the qualities of the waters.

Contributions to the hydrology of the United States, 1916; Nathan C. Grover, chief hydraulic engineer. — pp. Contains:

(e) Ground water for irrigation in the Morgan Hill area, Cal., by W. O. Clark. Scope indicated by title.

ANNUAL REPORTS.

ch of the papers contained in the annual reports was also issued in separate form.
nual reports are distributed free by the Geological Survey as long as its stock lasts. An asterisk (*) ates that this stock has been exhausted. Many of the papers so market, however, may be purchased the SUPERINTENDENT OF DOCUMENTS, WASHINGTON, D. C.

nth Annual Report of the United States Geological Survey, 1888–89, J. W. Powell, Director. 1890. 2 parts. *Pt. II, Irrigation, viii, 123 pp. 35c.

Makes a preliminary report on the organization and prosecution of the survey of the arid lands for purposes of irrigation; includes an account of the methods of topographic and hydraulic work, the segregation work on reservoir sites and irrigable lands, field and office methods, and brief descriptions of the topography of some of the river basins.

venth Annual Report of the United States Geological Survey, 1889–90, J. W. Powell, Director. 1891. 2 parts. Pt. II, Irrigation, xiv, 395 pp., 30 plates and maps. $1.25. Contains:

*Hydrography, pp. 1–110. Discusses scope of work, methods of stream measurement, rainfall, and evaportation, and describes the more important streams.

*Engineering, pp. 111–200. Defines the scope of the work and gives an account of the surveys in the Sun River basin and in the Arkansas, Rio Grande, California, Lahontan, Utah, and Snake River divisions.

*The arid lands, pp. 201–289. Includes statement of the Director to the House Committee on Irrigation, extracts from the constitutions of States relating to irrigation.

*Topography, pp. 291–343. Comprises reports of the topographic surveys in California, Nevada, Colorado, Idaho, Montana, and New Mexico, and a report on reservoir sites.

*Irrigation literature, pp. 345–388. Gives a list of books and pamphlets on irrigation and allied subjects mainly contained in the library of the United States Geological Survey.

elfth Annual Report of the United States Geological Survey, 1890–91, J. W. Powell, Director. 1891. 2 parts. Pt. II, Irrigation, xviii, 576 pp., 93 pls. $2. Contains:

*Hydrography of the arid regions, by F. H. Newell, pp. 213–361, Pls. LVIII–CVI. Discusses the available water supply of the arid regions, the duty of water, flood waters, relation of rainfall to river flow; classifies the drainage basins; and describes the rivers of the Missouri, Arkansas, Rio Grande, Colorado, Sacramento, and San Joaquin basins, and the principal streams of the Great Basin in Nevada and Utah and the Snake River drainage.

*Report upon the location and survey of reservoir sites during the fiscal year ending June 30, 1891, by A. H. Thompson, pp. 1–212, Pls. LIV–LVII. Describes reservoir sites on Yuba River, Deer Creek, Mokelumne River, Pacific Valley Creek, Big Canyon Creek, Hull Creek, Granite Lake, Cherry River, Lake Vernon, Big Meadows north of Hetch Hetchy Valley, and in Hetch Hetchy, California; for each reservoir site gives the location, height of dam, area inclosed by top contour, approximate contents of reservoir, position of irrigable lands, and areas of segregated lands.

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Thirteenth Annual Report of the United States Geological Survey, 1891–92, J. W. Powell, Director. 1892. (Pts. II and III, 1893.) 3 parts. *Pt. III, Irrigation, xi, 486 pp., 77 pls. $1.85. Contains:

*Engineering results of irrigation survey, by H. M. Wilson, pp. 351–427, Pls. CXLVII–CLXXXII. Describes results of surveys of High Sierra reservoirs—Bear Valley, Kennedys Meadow, Kennedys Lake, Lake Eleanor, Tuolumne Meadows, Lake Tenaya, and Little Yosemite—and of Clear Lake, Cal.

Sixteenth Annual Report of the United States Geological Survey, 1894–95. 4 parts. *Pt. II. Papers of an economic character, xix, 598 pp., 43 pls. $1.25. Contains:

The public lands and their water supply, by F. H. Newell, pp. 457–533, Pls. XXXV–XXXIX. Describes general character of the public lands, the lands disposed of (railroad, grant, and swamp lands, and private miscellaneous entries), lands reserved (Indian, forest, and military reservations), the vacant lands, and the rate of disposal of vacant lands; discusses the streams, wells, and reservoirs as sources of water supply; gives details for each State.

Eighteenth Annual Report, United States Geological Survey, 1896–97, Charles D. Walcott, Director. 1897. 5 parts in 6 volumes. *Pt. IV, Hydrography, x, 756 pp., 102 pls. $1.75. Contains:

*Reservoirs for irrigation, by J. D. Schuyler, pp. 617–740, Pls. XLVII–CII. Describes rock fill, masonry, and earthen dams, and hydraulic dam construction in California, and projected reservoirs; gives tables for reservoir capacities and areas.

Twentieth Annual Report of the United States Geological Survey, 1898–99, Charles D. Walcott, Director. 1899. (Parts II, III, IV, V, and VII, 1900.) 7 parts in 8 vols. and separate case for maps with Pt. V. *Pt. V, Forest Reserves, xix, 498 pp., 159 pls., 8 maps in separate case. $2.80. Contains:

*The San Gabriel Forest Reserve, by J. B. Leiberg, pp. 411–428, Pls. CXLIII–CXLVI. The San Bernardino Forest Reserve, by J. B. Leiberg, pp. 429–454, Pls. CXLVII–CLIII. The San Jacinto Forest Reserve, by J. B. Leiberg, pp. 455–478, Pls. CLIV–CLIX. Describes general topographic features of forest reserves and drainage, part of which is by streams tributary to the Pacific, and part by streams that are lost in the sands of the Mohave and other deserts.

BULLETINS.

An asterisk (*) indicates that the Geological Survey's stock of the paper is exhausted. Many of the papers so marked may be purchased from the SUPERINTENDENT OF DOCUMENTS, WASHINGTON, D.C.

*264. Record of deep-well drilling for 1904, by M. L. Fuller, E. F. Lines, and A. C. Veatch. 1905. 106 pp. 10c.

Discusses the importance of accurate well records to the driller, to owners of oil, gas, and water wells, and to the geologist; describes the general methods of work; gives tabulated records of wells in California, and detailed records of wells in Monterey and San Diego counties, California. These wells were selected because they give definite stratigraphic information.

*298. Record of deep-well drilling for 1905, by M. L. Fuller and Samuel Sanford. 1906. 299 pp. 25c.

Gives an account of progress in the collection of well records and samples; contains tabulated records of wells in California; and detailed records of wells in Alameda, Fresno, Kern, Orange, San Luis Obispo, Santa Clara, Tulare, and Ventura counties. The wells of which detailed sections are given were selected because they afford valuable stratigraphic information.

GEOLOGIC FOLIOS.

Under the plan adopted for the preparation of a geologic map of the United States the entire area is divided into small quadrangles, bounded by certain meridians and parallels, and these quadrangles, which number several thousand, are separately surveyed and mapped.[1] The unit of survey is also the unit of publication, and the maps and description of each quadrangle are issued in the form of a folio. When all the folios are completed they will constitute the Geologic Atlas of the United States.

[1] *Index maps* showing areas in California covered by topographic maps and by geologic folios will be *mailed on receipt of* request addressed to the Director, U. S. Geological Survey, Washington, D.C.

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A folio is designated by the name of the principal town or of a prominent natural ature within the quadrangle. Each folio includes maps showing the topography, ology, underground structure, and mineral deposits of the area mapped and several ges of descriptive text. The text explains the maps and describes the topographic d geologic features of the country and its mineral products. The topographic ap shows roads, railroads, waterways, and, by contour lines, the shapes of the hills nd valleys and the height above sea level of all points in the quadrangle. The real-geology map shows the distribution of the various rocks at the surface. The structural-geology map shows the relations of the rocks to one another underground. The economic-geology map indicates the location of mineral deposits that are commercially valuable. The artesian-water map shows the depth to underground-water horizons. Economic-geology and artesian-water maps are included in folios if the conditions in the areas mapped warrant their publication. The folios are of special interest to students of geography and geology and are valuable as guides in the development and utilization on mineral resources.

The folios numbered from 1 to 163, inclusive, are published in only one form (18 by 22 inches), called the library edition. Some of the folios that bear numbers higher than 163 are published also in an octavo edition (6 by 9 inches). Owing to a fire in the Geological Survey building May 18, 1913, the stock of geologic folios was more or less damaged by fire and water, but 80 or 90 per cent of the folios are usable. They will be sold at the uniform price of 5 cents each, with no reduction for wholesale orders. This rate applies to folios in stock from 1 to 184, inclusive, also to the library edition of folio 186. The library edition of folios 185, 187, and higher numbers sells for 25 cents a copy, except that some folios which contain an unusually large amount of matter sell for 50 cents a copy. The octavo edition of folio 185 and higher numbers sells for 50 cents a copy. If 34 folios selling at 25 cents each (or their equivalent in higher-priced folios) are ordered at one time a discount of 40 per cent is allowed; $5.10 is the minimum amount accepted at this rate.

All the folios contain descriptions of the drainage of the quadrangles. The folios in the following list contain also brief discussions of the underground waters in connection with the economic resources of the areas and more or less information concerning the utilization of the water resources.

An asterisk (*) indicates that the stock of the folio is exhausted.

*17. Marysville folio.
*39. Truckee folio.
*66. Colfax folio.
101. San Luis folio.
*138. Redding folio.
*163. Santa Cruz folio.
193. San Francisco folio, 75c. in either edition.

MISCELLANEOUS REPORTS.

Other Federal bureaus and State and other organizations have from time to time published reports relating to the water resources of various sections of the country. Notable among those pertaining to the Pacific slope of California are the reports of the Chief of Engineers, U. S. Army, the State engineer and surveyor, the State conservation commission, and the State water commission.

The following reports deserve special mention:

Hall, W. H., Physical data and statistics of California, 1886.
Report of the Commissioner of Public Works to the Governor of California, 1895.
Report of the State Water Commission of California, 1912.

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GEOLOGICAL SURVEY HYDROLOGIC REPORTS OF GENERAL INTEREST.

The following list comprises reports not readily classifiable by drainage basins and covering a wide range of hydrologic investigations:

WATER-SUPPLY PAPERS.

*1. Pumping water for irrigation, by H. M. Wilson. 1896. 57 pp., 9 pls.

Describes pumps and motive powers, windmills, water wheels, and various kinds of engines; also storage reservoirs to retain pumped water until needed for irrigation.

*3. Sewage irrigation, by G. W. Rafter. 1897. 100 pp., 4 pls. (See Water-Supply Paper 22.) 10c.

Discusses methods of sewage disposal by intermittent filtration and by irrigation; describes utilization of sewage in Germany, England, and France, and sewage purification in the United States.

*8. Windmills for irrigation, by E. C. Murphy. 1897. 49 pp., 8 pls. 10c.

Gives results of experimental tests of windmills during the summer of 1896 in the vicinity of Garden, Kansas; describes instruments and methods and draws conclusions.

*14. New tests of certain pumps and water lifts used in irrigation, by O. P. Hood. 1898. 91 pp., 1 pl. 10c.

Discusses efficiency of pumps and water lifts of various types.

*20. Experiments with windmills, by T. O. Perry. 1899. 97 pp., 12 pls. 15c.

Includes tables and descriptions of wind wheels, makes comparisons of wheels of several types, and discusses results.

*22. Sewage irrigation, Part II, by G. W. Rafter. 1899. 100 pp., 7 pls. 15c.

Gives résumé of Water-Supply Paper No. 3; discusses pollution of certain streams, experiments on purification of factory wastes in Massachusetts, value of commercial fertilizers, and describes American sewage-disposal plants by States; contains bibliography of publications relating to sewage, utilization, and disposal.

*32. Water resources of Puerto Rico, by H. M. Wilson. 1899. 48 pp., 17 pls. 15c.

Describes briefly topography, climate, rivers, irrigation methods, soils, forestation, water power, and transportation facilities.

*41. The windmill: its efficiency and economic use, Part I, by E. C. Murphy. 1901. 72 pp., 14 pls. 15c.

*42. The windmill: its efficiency and economic use, Part II, by E. C. Murphy. 1901. 75 pp., 2 pls. 10c.

Nos. 41 and 42 give details of results of experimental tests with windmills of various types.

*44. Profiles of rivers in the United States, by Henry Gannett. 1901. 100 pp., 11 pls. 15c.

Gives elevations and distances along rivers of the United States; also brief descriptions of many of the streams. Arrangement geographic. Many river profiles are scattered through other reports on surface waters in various parts of the United States.

*56. Methods of stream measurement. 1901. 51 pp., 12 pls. 15c.

Describes the methods used by the Survey in 1901–2. See also Nos. 64, 94, and 95.

64. Accuracy of stream measurements, by E. C. Murphy. 1902. 99 pp., 4 pls. (See No. 95.) 10c.

Describes methods of measuring velocity of water and of measuring and computing stream flow and compares results obtained with the different instruments and methods; describes also experiments and results at the Cornell University hydraulic laboratory. A second enlarged edition published as Water-Supply Paper 95.

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7. The motions of underground waters, by C. S. Slichter. 1902. 106 pp., 8 pls. 15c.

Discusses origin, depth, and amount of underground waters; permeability of rocks and porosity of soils; causes, rates, and laws of motions of underground water; surface and deep zones of flow; and recovery of waters by open wells and artesian and deep wells; treats of the shape and position of the water table; gives simple methods of measuring yield of flowing well; describes artesian wells at Savannah, Ga.

2. Sewage pollution in the metropolitan area near New York City and its effect on inland water resources, by M. O. Leighton. 1902. 75 pp., 8 pls. 10c.

Defines "normal" and "polluted" waters and discusses the damage resulting from pollution.

7. The water resources of Molokai, Hawaiian Islands, by Waldemar Lindgren. 1903. 62 pp., 4 pls. 10c.

Describes briefly the topography, geology, coral reefs, climate, soils, vegetation, forests, fauna of the island, the springs, running streams, and wells, and discusses the utilization of the surface and underground waters.

0. The relation of rainfall to run-off, by G. W. Rafter. 1903. 104 pp. 10c.

Treats of measurements of rainfall and laws and measurements of stream flow; gives rainfall, run-off, and evaporation formulas; discusses effect of forests on rainfall and run-off.

7. Irrigation in India (second edition), by H. M. Wilson. 1903. 238 pp., 27 pls. 25c.

First edition was published in Part II of the Twelfth Annual Report.

3. Proceedings of first conference of engineers of Reclamation Service, with accompanying papers, compiled by F. H. Newell, chief engineer. 1904. 361 pp. 25c.

Contains, in addition to an account of the organization of the hydrographic [water-resources] branch of the United States Geological Survey and the reports of the conferences, the following papers of more or less general interest:

Limits of an irrigation project, by D. W. Ross.
Relation of Federal and State laws to irrigation, by Morris Bien.
Electrical transmission of power for pumping, by H. A. Storrs.
Correct design and stability of high masonry dams, by Geo. Y. Wisner.
Irrigation surveys and the use of the plane table, by J. B. Lippincott.
The use of alkaline waters for irrigation, by Thomas A. Means.

4. Hydrographic manual of the United States Geological Survey, prepared by E. C. Murphy, J. C. Hoyt, and G. B. Hollister. 1904. 76 pp., 3 pls. 10c.

Gives instruction for field and office work relating to measurements of stream flow by current meters. See also No. 95.

5. Accuracy of stream measurements (second, enlarged edition), by E. C. Murphy. 1904. 169 pp., 6 pls.

Describes methods of measuring and computing stream flow and compares results derived from different instruments and methods. See also No. 94.

3. A review of the laws forbidding pollution of inland waters in the United States, by E. B. Goodell. 1904. 120 pp. (See No. 152.)

Explains the legal principles under which antipollution statutes become operative, quotes court decisions to show authority for various deductions, and classifies according to scope the statutes enacted in the different States.

0. Contributions to the hydrology of eastern United States, 1904; M. L. Fuller, geologist in charge. 1905. 211 pp., 5 pls. 10c.

Contains the following reports of general interest. The scope of each paper is indicated by its title.

Description of underflow meter used in measuring the velocity and direction of underground water, by Charles S. Slichter.

The California or "stovepipe" method of well construction, by Charles S. Slichter.

Approximate methods of measuring the yield of flowing wells, by Charles S. Slichter.

Corrections necessary in accurate determinations of flow from vertical well casings, from notes furnished by A. N. Talbot.

Experiment relating to problems of well contamination at Quitman, Ga., by S. W. McCallie.

Notes on the hydrology of Cuba, by M. L. Fuller.

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113. The disposal of strawboard and oil-well wastes, by R. L. Sackett and Isaiah Bowman. 1905. 52 pp., 4 pls. 5c.

The first paper discusses the pollution of streams by sewage and by trade wastes, describes the manufacture of strawboard, and gives results of various experiments in disposing of the waste. The second paper describes briefly the topography, drainage, and geology of the region about Marion, Ind., the contamination of rock wells and of streams by waste oil and brine.

114. Underground waters of eastern United States; M. L. Fuller, geologist in charge. 1905. 285 pp., 18 pls. 25c.

Contains report on "Occurrence of underground waters," by M. L. Fuller, discussing sources, amount, and temperature of waters, permeability and storage capacity of rocks, water-bearing formations, recovery of water by springs, wells, and pumps, essential conditions of artesian flows, and general conditions affecting underground waters in eastern United States.

115. River surveys and profiles made during 1903, by W. C. Hall and J. C. Hoyt. 1905. 115 pp., 4 pls. 10c.

Contains results of surveys made to determine location of undeveloped power sites.

119. Index to the hydrographic progress reports of the United States Geological Survey, 1888 to 1903, by J. C. Hoyt and B. D. Wood. 1905. 253 pp. 15c.

120. Bibliographic review and index of papers relating to underground waters published by the United States Geological Survey, 1879–1904, by M. L. Fuller. 1905. 128 pp. 10c.

Scope indicated by title.

*122. Relation of the law to underground waters, by D. W. Johnson. 1905. 55 pp. 5c.

Defines and classifies underground waters, gives common-law rules relating to their use, and cites State legislative acts affecting them.

143. Experiments on steel-concrete pipes on a working scale, by J. H. Quinton. 1905. 61 pp., 4 pls.

Scope indicated by title.

144. The normal distribution of chlorine in the natural waters of New York and New England, by D. D. Jackson. 1905. 31 pp., 5 pls. 10c.

Discusses common salt in coast and inland waters, salt as an index to pollution of streams and wells, the solutions and methods used in chlorine determinations, and the use of the normal chlorine map; gives charts and tables for chlorine in the New England States and New York.

145. Contributions to the hydrology of eastern United States, 1905; M. L. Fuller, geologist in charge. 1905. 220 pp., 6 pls.

Contains brief reports of general interest as follows:

Drainage of ponds into drilled wells, by Robert E. Horton. Discusses efficiency, cost, and capacity of drainage wells and gives statistics of such wells in southern Michigan.

Construction of so-called fountain and geyser springs, by Myron L. Fuller.

A convenient gage for determining low artesian heads, by Myron L. Fuller.

146. Proceedings of second conference of engineers of the Reclamation Service, with accompanying papers, compiled by F. H. Newell, chief engineer. 1905. 267 pp. 15c.

Contains brief account of the organization of the hydrographic [water-resources] branch and the Reclamation Service, reports of conferences and committees, circulars of instruction, and many brief reports on subjects closely related to reclamation, and a bibliography of technical papers by members of the service. Of the papers read at the conference those listed below (scope indicated by title) are of more or less general interest:

Proposed State code of water laws, by Morris Bien.

Power engineering applied to irrigation problems, by O. H. Ensign.

Estimates on tunneling in irrigation projects, by A. L. Fellows.

Collection of stream-gaging data, by N. C. Grover.

Diamond-drill methods, by G. A. Hammond.

Mean-velocity and area curves, by F. W. Hanna.

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146. Proceedings of second conference of engineers of the Reclamation Service—Continued.

Importance of general hydrographic data concerning basins of streams gaged, by R. E. Horton.
Effect of aquatic vegetation on stream flow, by R. E. Horton.
Sanitary regulations governing construction camps, by M. O. Leighton.
Necessity of draining irrigated land, by Thos. H. Means.
Alkali soils, by Thos. H. Means.
Cost of stream-gaging work, by E. C. Murphy.
Equipment of a cable gaging station, by E. C. Murphy.
Silting of reservoirs, by W. M. Reed.
Farm-unit classification, by D. W. Ross.
Cost of power for pumping irrigating water, by H. A. Storrs.
Records of flow at current-meter gaging stations during the frozen season, by F. H. Tillinghast.

147. Destructive floods in United States in 1904, by E. C. Murphy and others. 1905. 206 pp., 18 pls. 15c.

Contains a brief account of "A method of computing cross-section area of waterways," including formulas for maximum discharge and areas of cross section.

150. Weir experiments, coefficients, and formulas, by R. E. Horton. 1906. 189 pp., 38 pls. (See Water-Supply Paper 200.) 15c.

Scope indicated by title.

*151. Field assay of water, by M. O. Leighton. 1905. 77 pp., 4 pls. 10c.

Discusses methods, instruments, and reagents used in determining turbidity, color, iron, chlorides, and hardness in connection with the studies of the quality of water in various parts of the United States.

152. A review of the laws forbidding pollution of inland waters in the United States (second edition), by E. B. Goodell. 1905. 149 pp. 10c.

Scope indicated by title.

*155. Fluctuations of the water level in wells, with special reference to Long Island, N. Y., by A. C. Veatch. 1906. 83 pp., 9 pls. 25c.

Includes general discussion of fluctuation due to rainfall and evaporation, barometric changes, temperature changes in rivers, changes in lake level, tidal changes, effects of settlement, irrigation, dams, underground-water developments, and to indeterminate causes.

*160. Underground-water papers, 1906; M. L. Fuller, geologist in charge. 1906. 104 pp., 1 pl.

Gives account of work in 1905; lists of publications relating to underground waters, and contains the following brief reports of general interest:
Significance of the term "artesian," by Myron L. Fuller.
Representation of wells and springs on maps, by Myron L. Fuller.
Total amount of free water in the earth's crust, by Myron L. Fuller.
Use of fluorescein in the study of underground waters, by R. B. Dole.
Problems of water contamination, by Isaiah Bowman.
Instances of improvement of water in wells, by Myron L. Fuller.

*162. Destructive floods in the United States in 1905, with a discussion of flood discharge and frequency and an index to flood literature, by E. C. Murphy and others. 1906. 105 pp., 4 pls. 15c.

*163. Bibliographic review and index of underground-water literature published in the United States in 1905, by M. L. Fuller, F. G. Clapp, and B. L. Johnson. 1906. 130 pp. 15c.

Scope indicated by title.

*179. Prevention of stream pollution by distillery refuse, based on investigations at Lynchburg, Ohio, by Herman Stabler. 1906. 34 pp., 1 pl. 10c.

Describes grain distillation, treatment of slop, sources, character, and effects of effluents on streams; discusses filtration, precipitation, fermentation, and evaporation methods of disposal of wastes without pollution.

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*180. Turbine water-wheel tests and power tables, by R. E. Horton. 1906. 134 pp., 2 pls. 20c.

Scope indicated by title.

*185. Investigations on the purification of Boston sewage, by C.-E. A. Winslow and E. B. Phelps. 1906. 163 pp. 25c.

Discusses composition, disposal, purification, and treatment of sewages and recent tendencies in sewage-disposal practice in England, Germany, and the United States; describes character of crude sewage at Boston, removal of suspended matter, treatment in septic tanks, and purification in intermittent sand filtration and coarse material; gives bibliography.

*186. Stream pollution by acid-iron wastes, a report based on investigations made at Shelby, Ohio, by Herman Stabler. 1906. 36 pp., 1 pl. 10c.

Gives history of pollution by acid-iron wastes at Shelby, Ohio, and resulting litigation; discusses effect of acid-iron liquors on sewage purification processes, recovery of copper as from acid-iron wastes, and other processes for removal of pickling liquor.

*187. Determination of stream flow during the frozen season, by H. K. Barrows and R. E. Horton. 1907. 93 pp., 1 pl. 15c.

Scope indicated by title.

*189. The prevention of stream pollution by strawboard waste, by E. B. Phelps. 1906. 29 pp., 2 pls. 5c.

Describes manufacture of strawboard, present and proposed methods of disposal of waste liquors, laboratory investigations of precipitation and sedimentation, and field studies of amounts and character of water used, raw material and finished product, and mechanical filtration.

*194. Pollution of Illinois and Mississippi rivers by Chicago sewage (a digest of the testimony taken in the case of the State of Missouri *v.* the State of Illinois and the Sanitary District of Chicago), by M. O. Leighton. 1907. 369 pp., 2 pls. 40c.

Scope indicated by amplification of title.

*196. Water supply of Nome region, Seward Peninsula, Alaska, 1906, by J. C. Hoyt and F. F. Henshaw. 1907. 52 pp., 6 pls. 15c.

Gives results of measurements of flow of Alaskan streams, discusses available water supply for ditch and pipe lines and power development; presents notes for investors.

*200. Weir experiments, coefficients, and formulas, revision of paper No. 150, by R. E. Horton. 1907. 195 pp., 38 pls. 35c.

Scope indicated by title.

*218. Water-supply investigations in Alaska, 1906–7 (Nome and Kougarok regions, Seward Peninsula; Fairbanks district. Yukon-Tanana region), by F. F. Henshaw and C. C. Covert. 1908. 156 pp. 12 pls. 25c.

Describes the drainage basins, gives results of observations at the gaging stations, and discusses the water supply of the ditches and pipe lines, and possibilities of development; gives also meteorological records.

*226. The pollution of streams by sulphite pulp waste, a study of possible remedies, by E. B. Phelps. 1909. 37 pp., 1 pl. 10c.

Describes manufacture of sulphite pulp, the waste liquors, and the experimental work leading to suggestions as to methods of preventing stream pollution.

228. Water supply investigations of the Yukon-Tanana region, Alaska, 1907 and 1908. Fairbanks, Circle, and Rampart districts, by C. C. Covert and C. E. Ellsworth. 1909. 108 pp., 7 pls. 20c.

Describes the drainage basins; gives results of observations at gaging stations; discusses the water supplies of the ditches and pipe lines and possibilities of hydraulic development.

*229. The disinfection of sewage and sewage filter effluents, with a chapter on the putrescibility and stability of sewage effluents, by E. B. Phelps. 1909. 91 pp., 1 pl. 15c.

Scope indicated by title.

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*234. Papers on the conservation of water resources. 1909. 96 pp., 2 pls. 15c.

Contains the following papers, whose scope is indicated by their titles: Distribution of rainfall, by Henry Gannett; Floods, by M. O. Leighton; Developed water powers, compiled under the direction of W. M. Steuart, with discussion by M. O. Leighton; Undeveloped water powers, by, M. O. Leighton; Irrigation, by F. H. Newell; Underground waters, by W. C. Mendenhall; Denudation, by R. B. Dole and Herman Stabler; Control of catchment areas, by H. N. Parker.

*235. The purification of some textile and other factory wastes, by Herman Stabler and G. H. Pratt. 1909. 76 pp. 10c.

Discusses waste waters from wool scouring, bleaching, and dyeing cotton yarn, bleaching cotton piece goods, and manufacture of oleomargarine, fertilizer, and glue.

236. The quality of surface waters in the United States: Part I, Analyses of waters east of the one hundredth meridian, by R. B. Dole. 1909. 123 pp. 10c.

Describes collection of samples, method of examination, preparation of solutions, accuracy of estimates, and expression of analytical results.

238. The public utility of water powers and their governmental regulation, by René Tavernier and M. O. Leighton. 1910. 161 pp. 15c.

Discusses hydraulic power and irrigation, French, Italian, and Swiss legislation relative to the development of water powers, and laws proposed in the French Parliament, reviews work of bureau of hydraulics and agricultural improvement of the French department of agriculture, and gives résumé of Federal and State water-power legislation in the United States.

*255. Underground waters for farm use, by M. L. Fuller. 1910. 58 pp., 17 pls. 15c.

Discusses rocks as sources of water supply and the relative safety of supplies from different materials; springs and their protection; open or dug and deep wells, their location, yield relative cost, protection, and safety; advantages and disadvantages of cisterns and combination wells and cisterns.

*257. Well-drilling methods, by Isaiah Bowman. 1911. 139 pp., 4 pls. 15c.

Discusses amount, distribution, and disposal of rainfall, water-bearing rocks, amount of underground water, artesian conditions, and oil and gas bearing formations; gives history of well drilling in Asia, Europe, and the United States; describes in detail the various methods and the machinery used; discusses loss of tools and geologic difficulties; contamination of well waters and methods of prevention; tests of capacity and measurement of depth; and costs of sinking wells.

*258. Underground-water papers, 1910, by M. L. Fuller, F. G. Clapp, G. C. Matson, Samuel Sanford, and H. C. Wolff. 1911. 123 pp., 2 pls. 15c.

Contains the following papers (scope indicated by titles) of general interest:
Drainage by wells, by M. L. Fuller.
Freezing of wells and related phenomena, by M. L. Fuller.
Pollution of underground waters in limestone, by G. C. Matson.
Protection of shallow wells in sandy deposits, by M. L. Fuller.
Magnetic wells, by M. L. Fuller.

259. The underground waters of southwestern Ohio, by M. L. Fuller and F. G. Clapp, with a discussion of the chemical character of the waters, by R. B. Dole. 1912. 228 pp., 9 pls. 35c.

Describes the topography, climate, and geology of the region, the water-bearing formations, the source, mode of occurrence, and head of the waters, and municipal supplies; gives details by counties; discusses in supplement, under chemical character, method of analysis and expression of results, mineral constituents, effect of the constituents on waters for domestic, industrial, or medicinal uses, methods of purification, chemical composition; many analyses and field assays. The matter in the supplement was also published in Water-Supply Paper 254 (The underground waters of north-central Indiana).

274. Some stream waters of the western United States, with chapters on sediment carried by the Rio Grande and the industrial application of water analyses, by Herman Stabler. 1911. 188 pp. 15c.

Describes collection of samples, plan of analytical work, and methods of analyses; discusses soap-consuming power of waters, water softening, boiler waters, and water for irrigation; gives results of analyses of waters of the Rio Grande and of Pecos, Gallinas, and Hondo rivers.

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280. Gaging stations maintained by the United States Geological Survey, 1888–1910, and survey publications relating to water resources, compiled by B. D. Wood. 1912. 102 pp. 10c.

314. Surface water supply of Seward Peninsula, Alaska, by F. F. Henshaw and G. L. Parker, with a sketch of the geography and geology by P. S. Smith, and a description of methods of placer mining by A. H. Brooks. 1913. 317 pp., 17 pls. 45c.

Contains results of work at gaging stations.

*315. The purification of public water supplies, by G. A. Johnson. 1913. 84 pp., 8 pls. 10c.

Discusses ground, lake, and river waters as public supplies, development of waterworks systems in the United States, water consumption, and typhoid fever; describes methods of filtration and sterilization of water, and municipal water softening.

*318. Water resources of Hawaii, 1909–1911, by W. F. Martin and C. H. Pierce. 1913. 552 pp., 15 pls. 50c.

Describes the general features of the Islands and gives results of measurements of streams and of observations of rainfall and evaporation; contains a gazetteer.

334. The Ohio Valley flood of March–April, 1913 (including comparisons with some earlier floods), by A. H. Horton and H. J. Jackson. 1913. 96 pp., 22 pls. 20c.

Although relating specifically to floods in the Ohio Valley, this report discusses also the causes of floods and the prevention of damage by floods.

336. Water resources of Hawaii, 1912, by C. H. Pierce and G. K. Larrison. 1914. 392 pp. 50c.

Contains results of stream measurements in 1912.

337. The effects of ice on stream flow, by William Glenn Hoyt. 1913. 77 pp., 7 pls. 15c.

Discusses methods of measuring the winter flow of streams.

342. Surface water supply of the Yukon-Tanana region, Alaska, by C. E. Ellsworth and R. W. Davenport. 1915. 343 pp., 13 pls. 45c.

Presents results of 6 years' observations of the water supply of the Yukon-Tanana region, discusses climate and precipitation, and gives station records.

*345. Contributions to the hydrology of the United States, 1914. N. C. Grover, chief hydraulic engineer. 225 pp., 17 pls. 30c. Contains:

*(e) A method of determining the daily discharge of rivers of variable slope, by M. R. Hall W. E. Hall, and C. H. Pierce, pp. 53–65.

Scope indicated by title.

(f) The discharge of Yukon River at Eagle, Alaska, by E. A. Porter and R. W. Davenport, pp. 67–77, Pls. IV–V. 5c.

Describes briefly the location and size of the Yukon basin, the climatic conditions in the basin, and methods of collecting hydrometric data; compares run-off with precipitation, and gives table showing the discharge of some of the large rivers in the United States as compared with the discharge of the Yukon and the Nile.

364. Water analyses from the laboratory of the United States Geological Survey, tabulated by F. W. Clarke, chief chemist. 1914. 40 pp. 5c.

Contains analyses of waters from rivers, lakes, wells, and springs in various parts of the United States, including analyses of the geyser water of Yellowstone National Park, hot springs in Montana, brines from Death Valley, water from the Gulf of Mexico, and mine waters from Tennessee, Michigan, Missouri, and Oklahoma, Montana, Colorado and Utah, Nevada and Arizona, and California.

371. Equipment for current-meter gaging stations, by G. J. Lyon. 1915. 64 pp., 37 pls. 20c.

Describes methods of installing automatic and other gages and of constructing gage wells, shelters, and structures for making discharge measurements and artificial controls.

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372. A water-power reconnaissance in south-central Alaska, by C. E. Ellsworth and R. W. Davenport, with a section on southeastern Alaska, by J. C. Hoyt. 1915. 173 pp., 22 pls. 20c.

373. Water resources of Hawaii, 1913, by G. K. Larrison. 1915. 190 pp. 20c.

Contains results of stream measurements in 1913.

*375. Contributions to the hydrology of the United States, 1915. N. C. Grover, chief hydraulic engineer. 181 pp., 9 pls. Contains:

(c) The relation of stream gaging to the science of hydraulics, by C. H. Pierce and R. W. Davenport, pp. 77–84.

(e) A method of correcting river discharge for a changing stage, by B. E. Jones, pp. 117–130.

(f) Conditions requiring the use of automatic gages in obtaining records of stream flow, by C. H. Pierce, pp. 131–139.

Papers presented at the conference of engineers of the water-resources branch in December, 1914.

400. Contributions to the hydrology of the United States, 1916. N. C. Grover, chief hydraulic engineer.

(a) The people's interest in water-power resources, by G. O. Smith, pp. 1–8.

(c) The measurement of silt-laden streams, by R. C. Pierce, pp. 39–51.

(d) Accuracy of stream-flow data, by N. C. Grover and J. C. Hoyt, pp. 53–59.

PROFESSIONAL PAPERS.

*72. Denudation and erosion in the southern Appalachian region and the Monongahela basin, by L. C. Glenn. 1911. 137 pp., 21 pls. 35c.

Describes the topography, geology, drainage, forests, climate, and population, and transportation facilities of the region, the relation of agriculture, lumbering, mining, and power development to erosion and denudation, and the nature, effects, and remedies of erosion; gives details of conditions in Holston, Nolichucky, French Broad, Little Tennessee, and Hiwassee River basins, along Tennessee River proper, and in the basins of the Coosa-Alabama system, Chattahoochee, Savannah, Saluda, Broad, Catawba, Yadkin, New, and Monongahela rivers.

86. The transportation of débris by running water, by G. K. Gilbert, based on experiments made with the assistance of E. C. Murphy. 1914. 263 pp., 3 pls. 70c.

The results of an investigation which was carried on in a specially equipped laboratory at Berkeley, Cal., and was undertaken for the purpose of learning "the laws which control the movement of bed load and especially to determine how the quantity of load is related to the stream slope and discharge and to the degree of comminution of the débris."

A highly technical report.

ANNUAL REPORTS.

*Fifth Annual Report of the United States Geological Survey, 1883–84, J. W. Powell, Director. 1885. xxxvi, 469 pp., 58 pls. $2.25. Contains:

*The requisite and qualifying conditions of artesian wells, by T. C. Chamberlin, pp. 125–173, Pl. XXI. Scope indicated by title.

Twelfth Annual Report of the United States Geological Survey, 1890–91, J. W. Powell, Director. 1891. 2 parts. Pt. II, Irrigation, xviii, 576 pp., 93 pls. $2. Contains:

*Irrigation in India, by H. M. Wilson, pp. 363–561, Pls. CVII–CLVI. See Water-Supply Paper 87.

Thirteenth Annual Report of the United States Geological Survey, 1891–92, J. W. Powell, Director. 1892. (Pts. II and III, 1893.) 3 parts. *Pt. III, Irrigation, xi, 486 pp., 77 pls. $1.85. Contains:

*American irrigation engineering, by H. M. Wilson, pp. 101–349, Pls. CXI to CXLV. Discusses the economical aspects of irrigation, alkaline drainage, silt and sedimentation; gives brief history of legislation; describes perennial canals in Idaho, California, Wyoming, and Arizona; discusses water storage at reservoirs of the California and other projects, subsurface sources of supply pumping and subirrigation.

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Fourteenth Annual Report of the United States Geological Survey, 1892–93, J. W. Powell, Director. 1893. (Pt. II, 1894.) 2 parts. *Pt. II, Accompanying papers. xx, 597 pp., 73 pls. $2.10. Contains:

*The potable waters of the eastern United States, by W J McGee, pp. 1–47. Discusses cistern water, stream waters, and ground waters, including mineral springs and artesian wells.

*Natural mineral waters of the United States, by A. C. Peale, pp. 49–88, Pls. III and IV. Discusses the origin and flow of mineral springs, the source of mineralization, thermal springs, the chemical composition and analysis of spring waters, geographic distribution, and the utilization of mineral waters; gives a list of American mineral-spring resorts; contains also some analyses.

Nineteenth Annual Report of the United States Geological Survey, 1897–98, Charles D. Walcott, Director. 1898. (Parts II, III, and V, 1899.) 6 parts in 7 vols. and separate case for maps with Pt. V. *Pt. II, papers chiefly of a theoretical nature. v, 958 pp., 172 plates. $2.65. Contains:

*Principles and conditions of the movements of ground water, by F. H. King, pp. 59–294, Pls. VI to XVII. Discusses the amount of water stored in sandstone, in soil, and in other rocks, the depth to which ground water penetrates; gravitational, thermal, and capillary movements of ground waters, and the configuration of the ground-water surface; gives the results of experimental investigations on the flow of air and water through a rigid, porous media, and through sands, sandstones, and silts; discusses results obtained by other investigators, and summarizes results of observations; discusses also rate of flow of water through sand and rock, the growth of rivers, rate of filtration through soil, interference of wells, etc.

*Theoretical investigation of the motion of ground waters, by C. S. Slichter, pp. 295–384, Pls. XVII. Scope indicated by title.

Twentieth Annual Report of the United States Geological Survey, 1898–99, Charles D. Walcott, Director. 1899. (Parts II, III, IV, V, and VII, 1900.) 7 parts in 8 vols. and separate case for maps with Pt. V. *Pt. IV, Hydrography, vii, 660 pp., 75 plates. $1.40. Contains:

*Hydrography of Nicaragua, by A. P. Davis, pp. 563–637, Pls. LXIV to LXXV. Describes the topographic features of the boundary, the lake basin, and Rio San Juan; gives a brief résumé of the boundary dispute; discusses rainfall, temperature, and relative humidity, evaporation, resources, and productions, the ship, railway, and canal projects; gives the history of the investigations by the Canal Commission, and results of measurements on the Rio Grande, on streams tributary to Lake Nicaragua, and on Rio San Juan and its tributaries.

Twenty-second Annual Report of the United States Geological Survey, 1900–1901, Charles D. Walcott, Director. 1901. (Parts III and IV, 1902.) 4 parts. *Pt. IV, Hydrography. 690 pp., 65 pls. $2.20. Contains:

Hydrography of the American Isthmus, by A. P. Davis, pp. 507–630, Pls. XXXVII to L. Describes the physiography, temperature, rainfall, and winds of Central America; discusses the hydrography of the Nicaragua Canal route and the Panama Canal route; gives estimated monthly discharges of many of the streams, rainfall, and evaporation tables at various points.

BULLETINS.

*32. Lists and analyses of the mineral springs of the United States (a preliminary study), by A. C. Peale. 1886. 235 pp.

Defines mineral waters, lists the springs by States, and gives tables of available analyses.

*264. Record of deep well drilling for 1904, by M. L. Fuller, E. F. Lines, and A. C. Veatch. 1905. 106 pp. 10c.

*298. Record of deep-well drilling for 1905, by M. L. Fuller and Samuel Sanford. 1906. 299 pp. 25c.

Bulletins 264 and 298 discuss the importance of accurate well records to the driller, to owners of oil, gas, and water wells, and to the geologist; describes the general methods of work; gives tabulated records of wells by States, and detailed records selected as affording valuable stratigraphic information.

*319. Summary of the controlling factors of artesian flows, by Myron L. Fuller. 1908. 10c.

Describes underground reservoirs, the sources of underground waters, the confining agents, the primary and modifying factors of artesian circulation, the essential and modifying factors of artesian flow, and typical artesian systems.

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***479.** The geochemical interpretation of water analyses, by Chase Palmer. 1911. 31 pp. 5c.

Discusses the expression of chemical analyses, the chemical character of water and the properties of natural waters; gives a classification of waters based on property values and reacting values, and discusses the character of the waters of certain rivers as interpreted directly from the results of analyses; discusses also the relation of water properties to geologic formations, silica in river water, and the character of the water of the Mississippi and the Great Lakes and St. Lawrence River as indicated by chemical analyses.

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